Neuro
epidemiology

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Abstracts

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K1: Keynote Lecture 1

K1-1

GLOBAL BURDEN OF NEUROLOGICAL DISORDERS: UPDATES FROM THE GLOBAL BURDEN OF DISEASE 2010 PROJECT

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The Global Burden of Disease (GBD) approach is a systematic, scientific effort to quantify the comparative magnitude of health loss due to diseases, injuries, and risk factors by age, sex, and geography for specific points in time. It estimates premature death and disability due to 291 diseases and injuries, 1,160 sequelae (direct consequences of disease and injury), and 67 risk factors for 20 age groups and both sexes in 1990, 2005, and 2010 for 187 countries and 21 regions. Key principles of GBD include making use of all available data that meet quality inclusion criteria, correcting for biases in the data, and providing uncertainty intervals for all estimates.

GBD found that neurological disorders accounted for 74 million years lost to premature death and disability, or disability-adjusted life years (DALYs), in 2010 and accounted for 3% of total disease burden worldwide. Stroke, which is grouped under cardiovascular and circulatory diseases in the GBD cause list, accounted for 102 million years lost in 2010 (4% of total disease burden) and was the third leading cause of DALYs globally. Among neurological disorders, which in the GBD classification system include dementia, Parkinson's disease, epilepsy, multiple sclerosis, migraine, tension-type headaches, and other neurological disorders, migraine accounted for 30% of neurological disease burden. Migraine ranked 14th as a cause of DALYs and fifth as a cause of years lived with disability (YLDs) among people ages 15 to 49 worldwide in 2010. Epilepsy, which accounted for the next largest share of neurological disorders (24%), was the 21st and tenth leading cause of DALYs and YLDs, respectively, among children under 5 years of age in 2010. Dementia, which represented 15% of all neurological disease burden, ranked as the seventh-leading cause of DALYs among all people ages 70 years and above in 2010 and was the second-greatest cause of YLDS in this age group.

Comparing the ranking of neurological diseases in developing and developed regions reveals important differences. In developing nations, migraine was the most important neurological disorder as measured by number of DALYs followed by epilepsy and dementia. In developed nations, however, dementia was the leading neurological disorder followed by migraine and epilepsy.

K2: Keynote Lecture 2

K2-1

Abstract not received.

PS1: Stroke Epidemiology, Prevention and Management

PS1-1

CHALLENGES IN STROKE RESEARCH IN LOW TO MIDDLE INCOME COUNTRIES

Thrift A.

Monash University, Melbourne, Australia

Stroke is a major cause of mortality and disability worldwide. About 85% of stroke deaths occur in low and middle income countries (LMICs), despite the fact that these countries have a lower life expectancy. There is also some recent evidence that the incidence of stroke is now greater in LMICs than in high income countries, although these data rely on very few studies from LMICs. Furthermore, many of these studies conducted in LMICs may have had inadequate adherence to standardised surveillance methods, and this has resulted in marked heterogeneity in the findings. There are considerable challenges in conducting high quality research on stroke in LMICs. These challenges are even greater when the research is conducted in regions without the support base of a tertiary hospital or academic centre such as occurs in rural settings. Rural populations are often quite large and at present strategies to treat and prevent stroke in these regions are no different to those in urban regions where patients have access to tertiary care facilities. It is important to overcome these challenges so that stroke prevention and treatment can be better targeted within these non-urban regions where health care availability, knowledge, and outcomes are likely to differ. These issues will be explored in this presentation.

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PS1-2

EPIDEMIOLOGY OF STROKE IN SOUTH ASIA

Wasay M.

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Three of the top ten most populous countries of the world are located in south Asian region. The health care problems of this region are unique and different from the developed world. The rapidly changing socioeconomic scenario, fast increasing urbanization, longevity, changes in dietary patterns, and decrease in mortality from infectious diseases has made chronic illnesses of old age like coronary artery disease and stroke as the area of focus. This article reviews the state of stroke epidemiology, patterns and management issues in four south Asian countries including India, Pakistan, Sri Lanka and Bangladesh. The available literature is limited and mostly hospital based. The methodology of studies and reporting are different and hence direct comparisons are not possible in several situations. Very high prevalence of traditional risk factors in these countries including hypertension, diabetes, dyslipidemia, and smoking are alarming, whereas several non-traditional risk factors like use of water-pipe, desighee (saturated fatty acids), chewable tobacco, and infectious causes of stroke are under studied. The access to tertiary stroke care is limited, and the use of tissue plasminogen activator (tPA) is scarce. Public and care giver awareness of stroke risk factors and management is disappointing. The interest of governments and policy makers in stroke is suboptimal and in need of major rethinking.

PS1-4

MANAGEMENT OF ACUTE STROKE

Amir N.

Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates

With increasing life expectancy, the number of stroke victims is expected to rise. The disability and socioeconomic burden of stroke is tremendous. Intravenous thrombolysis with tissue plasminogen activator is the only approved therapy for ischemic stroke. Identification of a potential thrombolysis candidate is the initial step towards successful stroke management. The chain of stroke management starts with early recognition of stroke symptoms and sign, early involvement of the EMS and quick transport of the patient to a hospital where thrombolysis could be offered. It is also known that creation of a stroke system is beneficial in helping stroke patients. In emergency department, a quick triage for determination of time of onset of symptoms and an abbreviated neurologic exam to assess the deficits is required. Urgent brain CT to rule out bleeding is an essential part of acute stroke management. Inclusion and exclusion criteria for thrombolysis will be discussed. Blood pressure management is very important since high blood pressure increases the chances of intra or extracranial bleeding after thrombolytic therapy. Patients and relatives who are deemed potential candidates for thrombolysis must be informed about the risks and benefits of thrombolysis. Getting a written consent is not required but preferred. The dose of tissue plasminogen activator is calculated based on patient's body weight. The recommended dose is 0.9 mg/kg, total dose is 90 mg. The total dose is given in two divided portions, 10% of the total dose is given as a bolus and the remaining 90% is infused over an hour. Post thrombolysis management requires frequent neurologic examinations and management of blood pressure, avoidance of hyperglycemia, infection and other complications. Early rehabilitation is highly desirable.

PS1-5

DIFFICULTIES IN MEASURING STROKE REHABILITATION AND ADHERENCE TO BEST PRACTICE: AN EXAMPLE FROM AUSTRALIA

Cadilhac D.

Monash University, Melbourne, Australia

The provision of stroke rehabilitation includes therapy being provided in diverse settings (i.e. hospital, community or home) and by a range of health professionals. Ideally, the therapeutic interventions are tailored to address the patients' impairments and their goals for rehabilitation with the main objectives being to restore independence in daily function and maximising active participation in the community. However, evidence for the interventions can be highly variable and many tools or approaches in rehabilitation have not been standardised or validated. In addition, there remains uncertainty about how early stroke rehabilitation should commence. In Australia, a comprehensive set of clinical practice guidelines that include recommendations for stroke rehabilitation, have been developed. Measurement of adherence to these guidelines is undertaken every second year in a national audit of hospitals providing in-patient care for stroke rehabilitation that is auspiced by the National Stroke Foundation. The audit program was developed with oversight of a national advisory committee and a data dictionary and help notes were created to ensure consistent data collection. Inter-rater reliability is assessed during each audit. The aim of this presentation is to highlight the issues in measuring clinical care associated with stroke rehabilitation and where the current gaps in provision of evidence based care exists. For example, more than half of all people with stroke in Australian hospitals never receive a documented assessment of their rehabilitation needs and less than half are provided with lifestyle advice to reduce their risk of future stroke. The importance of using standardised measures for monitoring the quality of in-patient rehabilitation will be explained, as well as the benefits of evaluating care over different time periods. Since very few countries have established an audit program for inpatient rehabilitation this presentation will provide an overview of the process, strengths and limitations.

PS1-6

SECONDARY STROKE PREVENTION

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Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates

Stroke is the major cause of disability worldwide. Risk of stroke is high right after TIA. Identification and management of those risk factors that cause stroke is important for prevention as it can positively affect the outcome and is cost-effective. Like in any other medical condition, risk factor identification and management is of fundamental importance. Hypertension is a major risk factor for stroke. There is a clear association between both systolic and diastolic BP and risk of stroke. Evidence has shown that BP lowering is associated with a 30% to 40% reduction in risk of stroke. An absolute target BP level and reduction are uncertain and should be individualized, but benefit has been associated with an average reduction of approximately 10/5 mm Hg, and normal BP levels have been defined as <120/80 mm Hg. The optimal drug regimen to achieve the recommended level of reduction is uncertain but the available data indicate that diuretics or the combination of diuretics and an ACEI are useful. Life style changes including regular exercise and diet changes are recommended as well. Even though, the current evidence does not show any significant reduction in stroke recurrence with intensive glycemic control, it is recommended that blood glucose should be controlled to keep HBA1c below 7. Control of BP in patients with diabetes, type 1 and 2, as part of a comprehensive cardiovascular risk-reduction program, is highly recommended. Cigarette smoking is a potent risk factor for ischemic stroke and is associated with an approximate doubling of risk for ischemic stroke. Smoking cessation is encouraged. There is a modest association of elevated total cholesterol or low-density lipoprotein cholesterol (LDL-C) with increased risk of ischemic stroke. Statin therapy with intensive lipid-lowering effects is recommended to reduce risk of stroke and cardiovascular events among patients with ischemic stroke or TIA who have evidence of atherosclerosis, an LDL-C level >100 mg/dL, and who are without known CHD. It is reasonable to target a reduction of at least 50% in LDL-C or a target LDL-C level of <70 mg/dL to obtain maximum benefit. Decreasing alcohol intake, regular moderate intensity exercise and change in eating habits is recommended. For patients with recent TIA or stroke within the past 6 months and ipsilateral severe (70 to 99%) carotid artery stenosis, CEA is recommended if the perioperative morbidity and mortality risk is estimated to be <6%. Carotid artery stenting is an alternate option for patients. For patients with noncardioembolic ischemic stroke or TIA, the use of antiplatelet agents rather than oral anticoagulation is recommended. Aspirin 50–325 mg monotherapy, the combination of aspirin 25 mg and extended-release dipyridamole 200 mg twice daily and clopidogrel 75 mg monotherapy are all acceptable. For patients with cardioembolic ischemic stroke or TIA anticoagulation is recommended. Patients who cannot take oral anticoagulant, Aspirin is recommended. Combination of aspirin and clopidogrel is not recommended as it increases the risk of bleeding. Management of other cardiac conditions will be discussed.

PS2: Stroke Epidemiology, Prevention and Management

PS2-2

WHEN POLICY PRECEDES PRACTICE: MAXIMISING OPPORTUNITIES TO PREVENT RECURRENT STROKE

Thrift A.

Monash University, Melbourne, Australia

Introduction: Both pharmacological treatment and behavioural changes can improve risk factor control in patients with stroke, and thereby prevent recurrences. Strategies to improve the pharmacological control of risk factors include education of healthcare professionals to increase prescription of effective medications and to provide ongoing monitoring, and education of patients to improve compliance of medication use. When these strategies are supported by government policy and funding, uptake is likely to be enhanced. However, occasionally the policy (and funding) is not supported by evidence of efficacy and so uptake may be slow.

Objectives: The aim of this presentation is to discuss how clinical trials can be designed around current policy, thereby maximising opportunities to translate findings into practice. Example: In Australia, the publicly funded universal health care system, Medicare, reimburses General Practitioners (GPs) for health care consultations. One set of Medicare items, termed Chronic Disease Management (CDM), comprise organised care models to manage people with chronic health problems, including stroke. Such organised care has been shown to improve control of risk factors for cardiovascular diseases such as diabetes and blood pressure. Despite the fact that Medicare provides extra payments to GPs to utilise these items for people with stroke, there is no evidence that this organised management program is effective for this condition. Ongoing trial. In an ongoing multicentre cluster randomised controlled trial in Melbourne, Australia, participants are randomised to receive a CDM plan or usual care, with clusters by general practice. Participants in the CDM group are provided with organised care plans as well as education and support about risk factor management. CDM plans are reviewed at 3, 6, 12 and 18 months after baseline. The primary outcome is a change in the Framingham cardiovascular risk score (using blinded outcome assessors and 'intention-to-treat' analysis). Analysis of covariance will be undertaken to adjust for baseline risk score and confounding factors.

Conclusions: If effective this readily applicable program will enable GPs to more effectively manage their patients with stroke or TIA. Utilising strategies that are already part of policy (and funded by government) will enhance uptake when benefit is established, as there are fewer barriers to implementing the program.

PS2-3

CHANGE IN THE STROKE SUBTYPES WITH DYSLIPIDEMIA AND OTHER RISK FACTORS IN JAPAN

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4-2-22 Nishiki-cho, Tachikawa, Tokyo, Japan

The incidence of dyslipidemia patients has been increasing tremendously in Japan, particularly in younger adults aged 20 to 40, while it is decreasing in the US and other countries. The close relationship between dyslipidemia and ischemic heart disease is well known, but the relationship between dyslipidemia and stroke is still controversial. However, recent epidemiologic studies have indicated that high LDL-cholesterolemia is related to stroke, particularly atherothromboitc stroke. On other hands, the death rates as well as the occurrence rate of stroke is decreasing with time in Japan. Furthermore, the changes in the stroke subtypes are also prominent. Lacunar infarction has been the most common type of ischemic stroke in Japan for a long time. For example, Fig shows the average frequencies of subtypes of ischemic stroke in our hospital and one of our associated hospitals. The frequency of lacunar infarction was almost 50% between 1984 and 1998, but between 1998 and 2000, the frequency of lacunar infarction has decreased, while atherothrombotic cerebral infarction and cardioembolic stroke have been increased in frequency. This tendency was also seen in Hisayama, Japan, a rather suburban area in Japan. As you see in Fig, this tendency was most prominent in recent studies. The changing pattern of ischemic stroke subtypes is considered due to the change of life style in Japan, and might be related to increase in dyslipidemic patients. The Japan Stroke Guidelines as well as other guidelins indicated that treatment with statins is recommended for primary as well as secondary stroke prevention in dyslipidemia patients. However, further trials are needed, especially to optimize statin dosis for Japanese patients.

PS3: Mild Cognitive Impairment and Dementia

PS3-1

DEMENTIA IS MORE THAN ONLY COGNITIVE DECLINE: GAIT PATTERNS AS PRECLINICAL MARKERS

Ikram A.

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Cognitive decline is a hallmark of AD. Consequently, most research on the pre-clinical phase of AD has focused on the various cognitive domains that deteriorate during these years. Memory, executive function, processing speed are all affected by the accumulating AD pathology. However, the brain exerts its effect on many more bodily functions beside cognition. Gait is a complex movement, which is directly affected by proper brain function. It is therefore conceivable that brain pathology also exerts an effect on gait. So far the field of AD research has paid only little attention to gait dysfunction as early sign of AD. Most studies investigating gait did so in AD patients and found that loss of independence in AD patients is not solely attributable to cognitive impairment: many AD patients also exhibit severely impaired gait. As such, these patients are at an added risk of falls and fractures. In coming years, studies will be investigating the role of gait dysfunction as an early preclinical sign of AD. There is already evidence that gait and cognition are tightly linked in non-demented elderly. In future, gait assessment may aid as a novel marker in the prediction of AD. This knowledge may then contribute to studies investigating whether exercise and gait improvement can delay AD.

PS3-2

SEX, GENDER, AND DEMENTIA

Rocca W.A.

Mayo Clinic, Rochester, USA

Background: Dimorphic neurology studies neurologic diseases that are unique to one sex, diseases that have a different frequency (incidence or risk) in one sex, and diseases that manifest differently in one sex compared to the other (clinical manifestations, response to treatment, or prognosis). Sex refers to chromosomal, hormonal, and reproductive differences (biology). Gender refers to social and cultural differences, and changes with history (society).

Methods: I considered example of differences between men and women derived from my own work or from the literature.

Results: The incidence of dementia was higher in women in several European studies. This sex pattern was not observed in US studies. By contrast, the risk of mild cognitive impairment was higher in men in some studies. Some risk factors differ in men and women. For example, bilateral oophorectomy is a risk factor only in women. Apolipoprotein E genotype has a stronger association with risk of dementia in women. Education may have different effects in men and women. This difference may be mediated by gender factors (literacy rates in men and women).

Conclusions: There is a growing body of evidence about men to women differences in dementia. The study of men and women separately may be strategic to elucidate the causes of dementia and to develop preventive strategies.

PS4: Disorders of Motility

PS4-1

SEX AND GENDER EFFECTS IN PARKINSON'S DISEASE

Rocca W.A.

Mayo Clinic, Rochester, USA

Background: Dimorphic neurology studies neurologic diseases that are unique to one sex, diseases that have a different frequency (incidence or risk) in one sex, and diseases that manifest differently in one sex compared to the other (clinical manifestations, response to treatment, or prognosis). Sex refers to chromosomal, hormonal, and reproductive differences (biology). Gender refers to social and cultural differences, and changes with history (society).

Methods: I considered example of differences between men and women derived from my own work or from the literature.

Results: The incidence of Parkinson's disease (PD) was higher in men in several studies. Some risk factors differ in men and women. For example, bilateral oophorectomy is a risk factor only in women. Anemia and higher education are associated with increased risk in women. No consumption of coffee, head trauma, pesticide use, immunologic diseases, and family history of dementia are associated with increased risk of PD in men. Some of these differences in risk factors may be due to biological differences, some to social and cultural differences between men and women. Women more frequently have the tremor-dominant form of PD and more commonly experience dyskinesias. By contrast, men more often experience cognitive decline. Women respond better to levodopa, but develop more dyskinesias.

Conclusions: There is a growing body of evidence about men to women differences in PD. The study of men and women separately may be strategic to elucidate the causes of PD and to develop preventive strategies. A dimorphic approach may also be important in treatment and management.

PS4-2

THE USE OF BOTULINUM TOXIN TYPE A IN THE MANAGEMENT OF OROMANDIBULAR DYSTONIA

El Tamawy M.

Cairo University, Cairo, Egypt

Oromandibular dystonia is a type of focal dystonia that affects muscles of the jaw; mainly of two types: open mouth and closer mouth dystonia. Before the introduction of Botulinum Toxin in the management of this disorders in the last two decades, it represented a real intractable problem. In closure mouth dystonia the following muscles are injected bilaterally: masseter, temporalis and medial pterygoid. While in opening mouth dystonia the following muscles should be injected bilaterally: lateral pterygoid, anterior belly of digastric and myelohyoid. The effect starts within two weeks and lasts for 4–6 months. The exact dose and site of injection per each muscle will be discussed in addition to case presentation.

PS4-3

UPDATE IN GENETICS OF HEREDITARY SPASTIC PARAPLEGIA AMONG ARAB PENINSULA

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Hereditary Spastic Paraplegia (HSP) is a motor neuron disorder and belongs to highly heterogeneous group of neurodegenerative disorders. HSP is characterized by progressive spasticity and weakness of the lower limb and is classified as pure or uncomplicated form or as complex or complicated if manifested with additional neurological features. To date, more than 55 HSP loci denoted as SPG have been mapped and mutations have been identified in approx. 33 genes. in families with autosomal dominant (AD), autosomal recessive and X-linked inheritance. The clinical variability observed in HSP is supported by the large underlying genetic heterogeneity. The most common AD-HSP is SPG4 with the spastin gene mutation, accounting for 40–45% of AD-HSP. Meanwhile, the most frequent AR-HSP might be SPG11 with the spatacsin gene mutation, showing a complex phenotype including dementia and thin corpus callosum. The prevalence of HSP in the Arab peninsula is high due to high rate of consanguinity and endogamy in the population. In our study we utilized homozygosity mapping and exome sequencing approaches to establish genetic causes associated with different types and subtypes of HSP. We identified SPG11 as the main cause of HSP in this population. Also we have been able to underline novel mutations in alsin, erlin, and a recently new gene B4GALNT1. Discovering such new mutations/genes should help in understanding HSP pathophysiology and possible therapeutic options. This will also provide prenatal as well as postnatal genetic counseling for these HSP families.

PS4-4

PARASOMNIAS AND SLEEP RELATED MOVEMENT DISORDERS

Alkaylani M.

Mercy Health-Grand Rapids, USA

Neurologists and general practitioners encounter patients presenting with nocturnal or sleep related pathologic clinical events, with undesirable physical and mental phenomena and violent behavior during different sleep stages. These can be potentially dangerous, and can be challenging to the family and treating physicians. The differential diagnosis includes seizure activity, parasomnias, Sleep-related Movement Disorders, and psychiatric disorders. It is essential for the practitioner to make the correct diagnosis to provide appropriate treatment and counseling. We will review the main categories of parasomnias and Sleep-Related Movement disorders. The list includes sleep walking, sleep talking, sleep terrors and nightmares, REM behavior disorder, enuresis, restless legs syndrome, sleep myoclonus and hypnic jerks, and rhythmic movement disorder. We will explore how to differentiate these sleep disorders from other conditions, and will provide treatment updates.

PS4-5

CERVICAL ARTIFICIAL DISC REPLACEMENT

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Introduction: Early attempts at cervical disc arthroplasty were met with failure. The first implanation of a cervical disc arthroplasty device in a human was described by Fernstrom in Sweden in 1966. Today, cervical disc arthroplasty is a routine operation all over the world. The author presents his personal experience, indications and patient selection for this procedure. The surgical technique and results are discussed and recommendations are made.

Material and Method: Thirty five patients (22 males and 13 females) underwent cervical disc arthroplasty by the author over a two year period between December 2010 and December 2012. Age range was 31 to 58 years. All patients had radicular symptoms with failure of conservative treatment. One patient had two level arthroplasty and the remainder had one level only. The commonest leve was C6/7 followed by C5/6. Average hospital stay was 2 days. Cervical collar was not used post operatively. Average follow up is 9 months.

Results: Over 95% of patints were satisfied with outcome of surgery with almost complete resolution of symptoms at 3 months follow up. One patient who had constant neck pain post operatively and was reoperated at another institution. Most patients (87%) experienced transient swallowing difficulty and interscpular pain which resolved within a few days. One patient sufferred transient hoarsness of voice. No cases needed reoperation and no patinet sufferred postoperative bleeding or infection.

Conclusions: Cervical disc arthroplasty offers a more physiological alternative to fusion. It protects against accelarated adjacent segment degeneration. Our patients sufferred less post operative pain and reported faster return to full range of movement of the cervical spine. The prosthesis cost is however a hinderance for getting approval from insurance companies.

PS5: Epilepsy and Seizures

PS5-1

OUTCOME OF EPILEPSY AND PROGNOSTIC PREDICTORS OF SEIZURE RECURRENCE AFTER TREATMENT DISCONTINUATION

Beghi E., Giussani G.

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About 70% of patients with recent onset epilepsy achieve seizure-freedom with adequate antiepileptic drug (AED) treatment. For these patients, the questions of whether or not, when and how the therapy can be discontinued are as yet largely unresolved. The complexity of the matter relies in a number of aspects waiting for elucidation and/or requiring a careful evaluation of the risk/benefit ratio before the decision to stop or to continue AED therapy is taken. Studies have shown that the rate of seizure recurrence is about two to three times that observed in patients who continue AEDs. The percentage of children undergoing AED withdrawal is higher than that of adult patients. The decision to stop or continue drug treatment is also influenced by the occurrence of drug-related side effects. Based on published reports, several prognostic predictors of seizure recurrences can be identified. These include an abnormal EEG at the time of treatment discontinuation, the presence of a documented etiology, previous occurrence of partial seizures, epilepsy syndrome, prolonged duration of active disease, and number of drugs taken at time of treatment discontinuation. Age at onset of seizures was also found to affect the risk of seizure relapse but with opposite results. In contrast, sex, family history of seizures and epilepsy, and history of febrile seizures do not seem to predict seizure outcome after treatment stop. Several studies using multivariable analysis models identified combinations of risk factors affecting the risk of seizure relapse. Prognostic indexes were also developed.

PS5-2

CNS BUGS AND STROKE

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Stroke is the 2nd commonest cause of death worldwide responsible for 6.15 million deaths (10.8%). About 2/3rd of worldwide strokes occur in low and middle-income countries, leading to 5.36 million deaths. The risk factors and pattern of stroke are different in developing countries from those in developed countries. The majority of strokes are due to the traditional risk factors as hypertension, diabetes, obesity, smoking, alcohol addiction etc. However, in developing nations infections, nutritional deficiencies and tropical factors were responsible for small but significant number of strokes. The unusual stroke mechanisms specific or significantly more prevalent in the tropics include, sickle cell disease (Asia, Africa), cardioembolism due to Chagas' disease (Latin America), arteritis secondary to cysticercosis (Latin America, Africa, Asia), intraparenchymal and subarachnoid hemorrhages due to leptospirosis (South America, Asia), intracranial hemorrhages due to hemorrhagic enteric fevers (South America, Africa, Asia), vasculopathy due to neurobrucellosis (Latin America, and Middle East) cerebral infarctions and intracranial hemorrhages due to malaria (South America, Africa, Asia), vasculopathy. The other nontraditional factors associated with stroke seen worldwide but more prevalent in developing countries are opportunistic or coagulopathy due to HIV, vasculopathy due to CNS mycosis, vasculopathy and hemorrhagic stroke due to snake bite, stroke due to cerebral venous sinus thrombosis and cardioembolism due to rheumatic heart diseases and infective endocarditis.4,5 Apart from this Takayasu's Disease, Behcet's Disease and Moyamoya disease are remains an important cause of stroke in Asia especially Japan. Infection as a cause of stroke specially in young is an important cause in particular in the tropics and developing countries.

PS5-3

EEG PATTERNS OF ICTAL DISCHARGES IN FOCAL EPILEPSY

Alkaylani M.

Mercy Health-Grand Rapids, USA

EEG recording is a key tool in the diagnosis of epileptic seizure disorders, characterization and classification of seizures, and diagnosis of different epileptic syndromes. It also plays an essential role in determining the appropriate treatment approach, and understanding the prognosis. Video-EEG (VEEG) is essential for localization of the epileptogenic focus in potential surgical candidates for epilepsy surgery usually the first test to start the process of diagnostic work up. The epileptogenic focus can be located in any lobe, frontal, temporal, parietal, occipital, and in any of these locations it could be in the lateral convexities or mesial in location. These epileptogenic foci may produce different ictal and interictal EEG patterns during routine EEG and VEEG recordings. Therefore, it is very important to the epileptologist and the neurophysiologist to recognize the different ictal and interictal EEG findings in partial epilepsy.

PS5-4

EPILEPSY AND SLEEP DISORDERS

Mozahem K.

PO Box 108699, Abu Dhabi, United Arab Emirates

Epilepsy and sleep disorders, ICNE 22 November 2013 Abu Dhabi, UAE Sleep and epilepsy are inter-related. Sleep deprivation is used to improve the yield of EEG, and it is a known provocative factor in inducing seizures. Non-REM sleep, especially stage II, is a facilitating factor, 'epileptogenic', to improve the yield of EEG and induce seizures unrelated to sleep deprivation. Seizures of some generalized type epilepsies are common in the early hours of morning and on awakening. In some patients seizures are only nocturnal or sleep related the matter which has implications on management. Sleep disorders are common in patients with epilepsy.

PS6: General and Health Economic Aspects of Neurological Disorders

PS6-1

POPULATION NEURO-IMAGING: HISTORY, HIGHLIGHTS, FUTURE, AND CHALLENGES

Ikram A.

Dr Molewaterplein 50, Rotterdam, Netherlands

Over the last two decades population-based cohort studies have incorporated many novel imaging modalities to study early pre-clinical markers of disease. In the study of neurologic diseases, magnetic resonance imaging is currently the state-of-the-art imaging modality. Nowadays, etiologic research on neurodegenerative and cerebrovascular diseases is unthinkable without neuroimaging. This talk will review the developments over the last decade in the field of neuro-imaging in population studies. It will further discuss the main findings, the challenges, and future possibilities and limitations of population neuro-imaging. The role of population neuro-imaging studies in better understanding the earliest brain changes in dementia, including Alzheimer's disease, Parkinson disease, and vascular disease will be illustrated. Another specific focus will be on the combination of neuro-imaging with various other emerging biotechnologies. In this regard, genetics, metabolomics, functional imaging modalities, and novel analytical techniques will

be discussed. Work presented in this talk is funded by the Netherlands Organization for Health Research and Development (ZonMW) Veni-grant no.916.13.054 and Internationale Stichting Alzheimer Onderzoek #12533.

PS6-2

UNCOVERING THE EPIDEMIC: FINDINGS ON THE TRUE INCIDENCE OF TRAUMATIC BRAIN INJURY

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Background: Traumatic brain injury (TBI) is a leading cause of disability and death in young adults and has a significant impact on the injured person, their family/whanau, friends, and indeed society. However, the exact burden of TBI is not known.

Design: A prospective population-based TBI register in the total population of Hamilton and Waikato districts in 2010–2011 (173,208 residents). All new TBI cases were ascertained over a 12-month period using prospective and retrospective surveillance. Complete case ascertainment was assured using multiple overlapping sources of information for all new hospitalised and non-hospitalised TBI cases (fatal and non-fatal).

Results: The total incidence of TBI is 790/100,000 person-years (95% CI 749–832), with the bulk of the incidence due to mild TBI (95%). The risk of TBI in men is 77% greater than in women. Children and adolescents and young adults (aged 15–34) constituted almost 70% of all TBI cases. Most TBI cases are due to falls (38%), mechanical forces (21%), transport accidents (20%), and assaults (17%). Extrapolation of our estimates to the world population suggests that every year 54–60 million people sustain a TBI, which is almost 6 times higher than previous estimates.

Significance: This study is unique, being the only large population-based epidemiological study of TBI incidence and outcomes across the spectrum of severity in all age groups in urban and rural populations. The data suggest that the true burden of TBI is much greater than previously estimated.

PS6-6

ECONOMIC IMPLICATIONS OF NOT TRANSLATING EVIDENCE: A CASE STUDY

Cadilhac D.

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The ageing population in developed and developing countries will lead to an increase in the occurrence of many conditions associated with ageing such as high blood pressure, atrial fibrillation (AF) and stroke in society. Since resources for spending in health are limited, it is essential that economic analyses are undertaken to ensure there are evidence-based decisions on where to best invest these limited resources. The following presentation provides an overview of the economic implications of not translating evidence from the perspective of stroke. An example of how 'what if' scenario modelling can be used will be provided to describe the potential opportunity cost losses of not translating evidence into practice. The costs and health gain calculated include only those additional cases that would benefit if current practice were improved to a defined 'achievable' level. This involves estimating from the best sources of local data: 1) who is currently receiving evidence-based care; 2) who is eligible but not currently receiving evidence-based care; and 3) who could realistically (given that 100% coverage is not possible for all interventions) be receiving evidence-based care. The 'achievable' level therefore varies depending on the intervention, what we know happens in current practice and the realities of service provision. To assess the robustness of the estimates, 'best case/worst case' sensitivity analysis should be conducted by varying key variables such as size of eligible group and unit prices. Approaches such as this are useful for providing evidence for health care priority setting since the use of a standardised approach allows a range of interventions to be compared within the same model.

PS6-7

NATIONWIDE STROKE EPIDEMIOLOGY SURVEY IN CHINA: METHODOLOGICAL ISSUES

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Backgroud and Objectives: The most widely cited data on the incidence, prevalence, and mortality of stroke in China are derived from the studies in the 1980s. In the past three decades, stroke epidemiological features in China have changed a lot with the economic development. It is important to understand these changes to establish timely strategies for stroke prevention. To aim at revealing the characteristics of stroke transition, the Nationwide Epidemiological Survey of Stroke in China (NESS-China) will be implemented in 2013. The main purpose of the survey is to obtain the incidence, prevalence, and mortality of stroke in different regions in 31 provinces of China. The secondary purpose is to access relevant data on stroke and transient ischemic attack, including risk factors, treatment, and secondary prevention.

Methods: This survey is one of the China National Key Technology R&D Programs during the 'Twelve-Fifth Plan' period (grant no. 2011BAI08B01). The epidemiological survey will be conducted in 157 districts and counties which are distributed all over the country, and which come from the National Disease Surveillance System in 31 provinces (municipal cities). A multi-stage stratified cluster sampling method will be applied to obtain the sample population based on national census data of 2010, which can represent urban and rural residents in China. Each site will complete the survey of 3,800 people and the total sample size is expected to be more than 600,000 populations. The survey will be completed in cooperation of staffs from the Provincial Centers for Disease Control (CDC) and neurologists from the high level hospitals in each province. During the survey, the investigators from CDC firstly screen the patients (or possible patients) of

stroke with a questionnaire, which ask some symptoms and signs of stroke or stroke/TIA history. The screening survey need to be completed by door-to-door, and interview rate must be over 85%. Secondly, every individual with a positive symptom and sign or stroke/TIA history will need to be re-interviewed by a neurologist and to make a diagnosis, and then neurologists record the relevant information in detail of those with stroke/TIA. At the same time, neurologists need to re-check the death cases from January 1, 2012 to the survey date. We used the ARIC (Athrosclerosis Risk In Communities Study) study diagnostic criterion in this survey. The stroke classifications are as follow: definite or probable subarachnoid hemorrhage (SAH); definite or probable brain hemorrhage; definite or probable brain infarction, possible stroke of undetermined type. NESS-China is on going research project. The results of this survey will be announced in the next one or two years.

PS7: Pain and Peripheral Nervous System Disorders

PS7-1

GLOMUS TUMOR: AN ATYPICAL AND FORGETTABLE NEUROPATHIC PAIN, 35 YEARS EXPERIENCE

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Objectives: To review a large series of glomus tumors from 3 Middle East countries in order to achieve a better understanding of their presentation and provide guidelines to aid in their rapid diagnosis and treatment.

Patients and Methods: We performed a retrospective review of all glomus tumors seen during a 35-year period (1978–2013) to document the incidence, duration of symptoms, the contribution of imaging in making a definite diagnosis, and the efficacy of treatment.

Results: Forty four patients with glomus tumors presented as follows: scalp (3), nose (3), cheek (2), ear lobe (3) and intravascular (1), subangual in the fingers (3), extensor surface of fingers (3), bulb of fingers (3), wrist (3), forearm (1), elbow (2), arm (2), axilla (2), shoulder (2), toe nails (2), dorsum of foot (1), ankle (1), leg (1), knee (1), thigh (1), buttock (1), back (1), abdomen (1), coccyx (1). Forty-four patients presented with neuropathic pain, allodynia, hyperesthesia, hyperpathia, hyperalgesia and exquisite focal tenderness, but only 1 patient presented with cold intolerance. The average duration of symptoms was greater than 10 years, with most patients being evaluated previously and having their conditions misdiagnosed. Magnetic resonance imaging proved to be the most useful modality for localization of these lesions. Surgical resection was the definitive treatment and generally provided immediate and sustained pain relief.

Conclusions: Glomus tumors are relatively rare. The characteristic clinical history, neurologic examination, sonographic, radiologic, pathologic and genetic will be presented. Treatment outcomes are excellent; however, misdiagnosis and delayed diagnosis are common. Improving the guidelines regarding clinical features and diagnosis of these neoplasms may reduce morbidity, ensuing chronic pain, and psychiatric consequences of delayed diagnosis or misdiagnosis.

PS7-2

ALTERNATIVE HEADACHE THERAPY

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In men, the lifetime prevalence is 93% for headache of any kind, 8% for migraine and 69% for tension-type headache. For women, lifetime prevalence is 99% for headache of any kind, 25% for migraine and 88% for tension-type headache. In children, headache prevalence increases from 39% at the age of six, to 70% at the age of 15 years. Three percent of the general population have chronic headache, i.e., a headache ≥15 days per month. They are the most severely disabled. Despite improvements, headache disorders remain under diagnosed and under treated. Only 29% of migraine sufferers report satisfaction with their usual acute treatment. The efficacy of some nonpharmacologic therapies appears to approach that of most drugs used for the prevention of migraine and tension type headaches. This, in part, explains why so many individuals seek alternative therapies for headache relief. Established therapies include Riboflavin, Magnesium, Butterbur, Feverfew and CoQ10. More recently combination therapy with cyanocobalamin, folate and pyridoxine has proven beneficial in patients suffering specifically from migraine with aura. Aerobic exercise, psychological therapies and acupuncture have also been of benefit.

PS7-3

INVASIVE HEADACHE THERAPY

Kayed D.M.

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Headaches are the most prevalent neurological disorders and among the most frequent symptoms seen in general practice. Fifty percent of the general population has headaches during any given year, and more than ninety percent report a lifetime history of headache. Three percent of the general population have chronic headache, i.e., a headache ≥15 days per month. They are the most severely disabled. Invasive headache therapy includes a variety of procedures such as occipital nerve blocks, Botulinium toxin injections, and the more controversial deafferentation procedures. Neurostimulation has emerged as a new modality. Transcranial magnetic stimulation is a noninvasive central neurostimulation

technique. Invasive central neurostimulation strategies include deep brain stimulation. Peripheral nerve stimulation techniques include occipital nerve stimulation and vagal nerve stimulation as well as other extracranial nerve stimulation procedures and sphenopalatine ganglion stimulation.

PS8: Multiple Sclerosis

PS8-1

EPIDEMIOLOGY OF MULTIPLE SCLEROSIS IN ASIAN COUNTRIES

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Although data related to epidemiology of MS is still limited in a number of countries, western Asia, including Middle Eastern countries, has the highest prevalence of MS among Asian countries, and MS in that region largely resembles conventional MS in western countries. On the other hand, optic-spinal MS, a distinct clinical entity from conventional MS, is more common in Asia, especially eastern Asia. Data from south Asia is growing specially from India, Pakistan and Iran. Larger epidemiological and genetic studies with more complete ascertainment in various Asian populations are needed to understand the diversity of Asian MS.

PS9: CNS Infections and Tumours

PS9-1

NEUROBRUCELLOSIS AT RISE OF PRESENT MILLENNIUM

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Objective: Determine the frequency, clinical patterns, optimal diagnostic and therapeutic procedures, and prognosis of neurobrucellosis.

Background: Brucellosis is hyperendemic in the Middle East. Neurobrucellosis range from 1.7–10%. We present 100 cases of neurobrucellosis manifesting in various distinct patterns. These included menigoencephalitis, polyradiculopathy, myelopathy, cranial nerve deficit, cerebellar, extrapyramidal or overlap syndromes. Psychiatric features are exceedingly rare and commonly unrecognized mode of presentation. We attempted at identifying patients with neurobrucellosis over a 33 years period with the intention of documenting all cases in which psychiatric manifestations were major or prominent.

Methods: Prospective study that involved 3 countries (Kuwait, Jordan and United Arab Emirates); over the period from 1980 to 2013. Diagnostic laboratory and radiological techniques were used as needed.

Results: 100 cases of neurobrucellois were diagnosed over the same period. 32 (32%) cases had psychiatric manifestations as either a major or prominent mode of presentation. These were in the form of confusional (15), depressive (11), Schizophreniform (4) and manic psychosis (2). Neurologic manifestations included meningoencephalitis (18), lower motor neuron (15), cranial nerves (13), autonomic (13), pyramidal (8), speech (5), cerebellar (4), sensory (4), extrapyramidal (2) and apractic (1) or cauda equina lesions (1).

Conclusions: Psychiatric manifestations constitute one third of the presentations of neurobrucellosis. They constitute a prominent clinical category. Combined antibacterial, antipsychotic and steroid therapy resulted in full recovery of solely acute meningoencephalitic cases; others were left with minor, moderate or severe disability. This should alert general practitioners, physicians, psychiatrists and neurologists about protean manifestations of neurobrucellosis. High index of suspicion is imperative in endemic areas. Differential diagnostic window should not be prematurely closed. Blind psychotherapy may lead to undue delay in diagnosis and treatment, more neurological damage and chronic disability.

PS9-2

NAVIGATION GUIDED ENDOSCOPIC TRANSPHENOIDAL PITUITARY REGION SURGERY

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Introduction: Transphenoidal pituitary surgery was first decribed in 1907 by Schloffer. Harvey Cushing standarised the oronasal rhinoseptal approach in 1910. Advances in nasal endoscopy led to cooperation between neurosurgeons and ENT surgeons in this field. This report discusses the cases treated by our team consisting of one neurosurgeon, one ENT surgeon, two endocrinologists and one ophthalmologist between March 2007 and December 2012.

Material and Method: Thirty six patients (12 females and 24 males) presented to our hospital between March 2007 and December 2012. Age range was 9–80 years. Most patients presented with visual failure. Pituitary apoplexy was the next most common presentation in our series. Hypopituitarism was present in only six patients.

Results: Most cases were non functioning adenomas. There were 3 Carniopharyngiomas, 2 Rathke's Cleft cysts, 2 prolactinomas and one arachnoid cyst. Two cases had CSF leak requiring repair and 6 cases had transient Diabetes Insipidus. Vision improved in 90% of cases. There was no permanent added impair-

ment to pituitary function. There was no mortalities and 2 patients sufferred postoperative complications.

Conclusions: Endoscopic navigation guided transphenoidal surgery is a safe and reliable procedure. We recommend workind as a team od Neurosurgeon and ENT surgeon. We do not recommend prepairing a mucosal flap as a routine for each case.

PS10: Amyotrophic Lateral Sclerosis

PS10-1

PREDICTORS OF LONG-TERM SURVIVAL AMONG PATIENTS WITH ALS

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Although amyotrophic lateral sclerosis (ALS) is considered a neurological condition leading to death 3–5 years after onset of symptoms, better survival rates have been found when comparing clinical series observed in the last decades to the previous reports. Percutaneous gastrostomy, mechanical ventilation, tracheostomy and comprehensive care have been thought to prolong survival. However, population-based studies failed to show better survival in the most recent patients' cohorts or even documented an unexpected decline in survival. These contrasting results can be mostly interpreted on the basis of the sample size (small in most cases), the study patients (population-based vs. clinic based), and the differing periods of follow-up. However, there is increasing evidence that ALS is a heterogeneous disease with differing phenotypes, each affecting survival to a different extent. Younger age and spinal onset are consistently reported to have a better outcome. A slower rate of symptom progression was also found to predict longer survival. Fronto-temporal dementia, nutritional status, and respiratory function and psycho-social factors are also implicated. There are reports on the long-term outcome of ALS, but only few of them from community-based studies. In a large population-based study of a cohort of patients with ALS, followed for up to 15 years, longer survival was predicted by younger age, spinal onset, male gender, and suspected ALS. After age 80 yr, survival in patients with ALS was similar to the general population. These findings can be usefully employed to predict long-term survival at the time of ALS diagnosis.

PS11: Environmental Risk Factors for Neurological Disorders

PS11-1

AIR POLLUTION AND STROKE INCIDENCE

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Atmosperic pollution is considered a major issue of environmental health. However, although the short-term effects of air pollution on both respiratory health and mortality are well documented, lesser is known about its impact on cerebrovascular diseases. A limited number of high-quality epidemiological studies investigated the association between stroke incidence and air pollution by several pollutants including particulate matter (PM), nitrogen dioxide (NO2), sulphur dioxide (SO2), carbon monoxide and ozone. Some studies assessed the effects of air pollution on acute stroke mortality, but, using mortality indicators, it cannot be determined whether air pollution is a causative factor of stroke occurrence or only a precipitating factor of death after stroke. Several factors could account for the opposing results of studies focusing on the influence of air pollution on stroke epidemiology:differences in case-mix population and distribution of vascular risk factors, differences in the assessment of air pollution exposure, influence of meteorological features, differences in ythe procedures for case ascertainment, the study design, and the outcome evaluated. Finnally, basic research studies suggested potential pathophysiological mechanisms that could account for the observed relatiobnship between air pollution and stroke, including oxydative stress, and systemic inflammatory responses. These phenomena may contribute to atherosclerotic plaque instability, alterations in endothelial function, cardiac arrhythmia, and increased coagulation and thrombosis. All together, these reactions may foster the occurrence of cerebrovascular diseases by distnct ways. However, further studies are required to a better understanding of this process.

PS11-2

VITAMIN D AND STROKE PROGNOSIS

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Vitamin D deficiency is a common condition especially in elderly people and those who have suffered from stroke. Given its long half-life, 25-hydroxyvitamin D (25(OH)D) is the appropriate biomarker to be measured so as to determine total body vitamin D stores. Several epidemiological studies demonstrated that low 25(OH)D levels were associated with an increased risk of cardiovascular diseases including stroke, myocardial infarction, and

carotid atherosclerosis. In addition, more recently, it has been showed that low 25(OH)D may be related to a higher clinical severity and a poorer early functional outcome in stroke patients. The mechanisms underlying the deleterious effect of low 25(OH)D levels remain to be elucidated. It has been suggested that vitamin D may have neuroprotective properties, and vitamin D supplementation could contribute to reducing the volume of cerebral infarct in animal models of stroke. Moreover, 25(OH)D could promote neuroplastic changes supporting clinical recovery after stroke. Based on these observations, despite the fact that interventional studies on vitamin D supplementation did not demonstrate any reduction in the incidence of stroke, the evaluation of a potential beneficial effect of vitamin D supplementation on lowering stroke severity and improving outcome could be of interest.

IS: Interactive Session

IS-1

JUVENILE MYOCLONIC EPILEPSY – IS IT TRULY BENIGN?

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Juvenile myoclonic epilepsy (JME) is common idiopathic generalized epilepsy, constituting 7–10% of all epilepsies. First described by Herpin in France, at present, JME is at the focus of several studies, both in India and abroad. Typically, JME presents in adolescence, with myoclonic jerks being the sine-qua-non, especially occurring immediately after awakening. Generalized tonic-clonic seizures and rarely absence seizures are also encountered. The patient usually comes to notice only after the onset of GTCS, a point which contributes to the delay in the accurate diagnosis of JME, especially in countries like India, a point which has been highlighted by several authors. A good and reliable history can easily draw the attention of the physician to this entity, which can be confirmed by the typical Electroencephalographic findings. A photo paroxysmal response can be elicited in roughly a third of all patients with JME. Neuroimaging is usually not warranted. Valproate is the drug of choice, with 86–90% patients deriving benefit from valproate alone. Levetiracetam and lamotrigine are also used frequently. Several patients remain well controlled, while some may relapse even during adequate doses of AEDs. AEDs may have to be taken lifelong. Some patients of JME develop behavioral abnormalities. Hence, one is compelled to ponder whether JME is actually as benign as it was once purported to be. To conclude JME is an important form of generalized epilepsy, it is still under-recognized and under diagnosed, it occurs in the adolescent group and reproductive age group, the treatment needs to be taken life long, Valpraote and even newer AEDs used for JME are known to cause NTD, psychiatric illnesses like Depression Anxiety and mood disorders are twice as common in JME patients, more and more neuropsychiatric and neuroimaging abnormalities are being recognized; thus increasingly casting doubts on the popular notion that JME is a benign epilepsy.

SS1: Satellite Symposium of the Environmental Neurology Research Group of the World Federation of Neurology

SS1-1

WHEN AND HOW DO ENVIRONMENTAL FACTORS ACT ON LIVING ORGANISMS?

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We are investigating a crucial and sensitive phase of the human development, early life and the épigénome. 'Early life' involves fetal and post natal life. This irreversible sequential timing of the human development is a critical window. This is illustrated by P.GRANDJEAN when he refers to the brain, saying: 'one chance only'! Awareness of the early origins of diseases comes first from Neurotoxicology and Teratology. There appeared: the thalidomide disaster in the fifties (1957–1961), the recognition in the sixties of Minamata disease causation. Fetal alcohol syndrome was described in case series in 1968. Needleman et and colleagues had reported dose-related mental deficits in children with previous lead exposure at 'background' levels in 1979. But, exposure to chemicals had not yet been seen as a major risk factor for human development. Therefore the first congress of fetal programming and developmental toxicology took place only in 2007. Interest in 'Early life' arose with epidemiological retrospective studies conducted in the UK in the eighties. Analyzing birth and death records, BARKER showed a correlation between low birth weight and the rates of adult deaths from ischemic heart disease. Birth size and weight reflect mostly fetal intrauterine growth, nutrition, endocrine condition and maternal environment. Birth weight thus became a risk factor for cardiovascular disease, diabetes, obesity, metabolic syndrome. BARKER's hypothesis had tremendous repercussions. It completely changed the approach regarding the role of nutrition during early life as well as causation of some major prevailing diseases in western countries. By the beginning of the 21st century, the fetal origin of diseases turned was labeled the Developmental Origin of Health and Diseases (DOHaD) (2003–2004). This approach is now being used increasingly. The next step was to investigate beyond nutrition and link fetal development to exposure to other factors (maternal and fetal stress, chemicals). It became also clear that one of the underlying mechanisms was Epigenetics. Epigenetics is a word coined in 1939, by Conrad WADDINGTON 'as a suitable name for the branch of biology which studies the causal interactions between genes and

their products which bring the phenotype into being.' Only 30 years later, Epigenetics became a field of interest, but the meaning had evolved. For M.SZIF Epigenetics is 'The combinations of mechanisms, which confer long-term programming to genes and could bring about a change in gene function without changing gene sequence' For E.JABLONKA 'Epigenetics deals with its interpretation and integration with information from other sources (DNA)'. In this view 'Phenotype is the net result of continued gene – environment interactions'. In 2004, JABLONKA speculated that an Epigenetic epidemiology will arise and 'might be defined as 'the part of epidemiology that studies the effects of heritable epigenetic changes on the occurrence and distribution of diseases'. This stresses the fact that the Environment has a major action on Living organisms: 'Environment being an inducer as well as a selector of variation' (JABLONKA).

SS2: Neuroepidemiology in Developing Countries

SS2-1

THE SANOFI ACCESS TO MEDICINES PROGRAM IN EPILEPSY: A CONTRIBUTION OF THE PRIVATE SECTOR TO REDUCE THE TREATMENT GAP

Gérard D.

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Dramatic progress has been made in ensuring access to medicines for communicable diseases such as HIV, TB and malaria. Major pharmaceutical companies have played a crucial role in this positive evolution through public-private partnerships (PPP). However, although epilepsy is the most prevalent of the chronic neurological disorders, in many developing countries, the majority of people with epilepsy have no access to adequate healthcare.

Sanofi believes that epilepsy should also benefit from PPPs, which could be decisive levers in improving access to care and promoting psychosocial rehabilitation in Low and Middle income countries.

In the various partnerships established through its Access to Medicines in epilepsy programs, Sanofi is involved through its local teams, its unique expertise in developing Information-Education-Communication tools, impact studies, differentiated pricing policies and supply management, and its networks.

Promoting an equitable access to care for people with epilepsy requires the collaboration of all partners. Utilizing the complementary competencies of Health Ministries, Non-Governmental Organizations, academics and pharmaceutical companies is the only way to develop innovative and sustainable solutions to address epilepsy challenges in developing countries.

As part of its commitment to epilepsy Sanofi has set up an annual forum (IMPACT epilepsy) which is a unique opportunity for stakeholders in the epilepsy domain to meet and discuss key issues; it has developed a set of educational tools aimed at the local communities (including a comic book) which have been adapted for Arabic, Sub Saharan African, Central American and Asian countries; it has supported the design and implementation of epidemiological studies in countries where data on epilepsy were not available; Sanofi has also set up tier-pricing policies in several countries in order to make its antiepileptic drugs accessible to the poorest in a sustainable way.

SS2-2

TESTING INNOVATIVE APPROACHES FOR IMPROVING ACCESS TO CARE OF PEOPLE WITH EPILEPSY IN LAO PDR AND KINGDOM OF CAMBODIA

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Context and Objective: There is a strong consensus that to make certain medical services reach population in a straightforward manner, this needs to be done through primary care (PC). While it is since long clear that what 'ought to be done', 'how it is to be done' remains an unresolved challenge. This is what we intend to demonstrate by testing one innovative strategy to improve access to care of people with epilepsy (PWE) through PC, and through existing resources, in two low- and middle-income countries (LMIC) in Asia. Thus, in order to provide cer-

Fig. 1. Project locations.

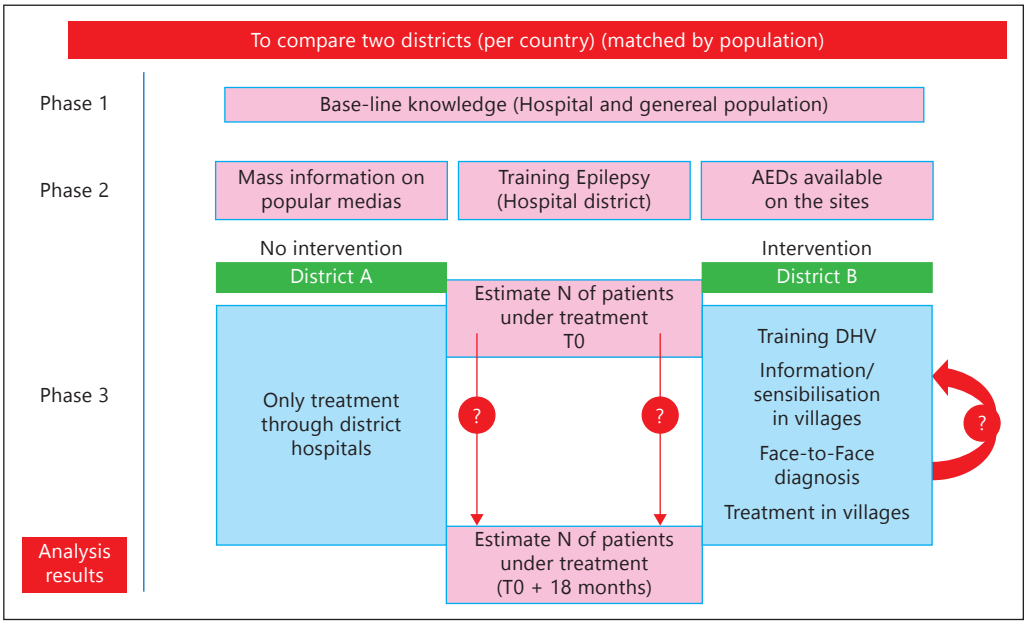

Fig. 2. General methodology of the projects.

tain services through PC, two conditions at least should be fulfilled:

1. There must be a service provider (SP); and
2. There must be a suitable strategy through which SP gets engaged in such a manner that his/her services become more accessible for the population concerned

Looking at 1st prerequisite, the first SP comes in our mind is a doctor, but they are acutely insufficient in number. In Laos, only 7 doctors work at the PC level. Apart from doctors, it is the same story for other SPs (nurses, midwives, etc). While each country should ideally have 2.3 health workers (doctor, nurse or midwife) for every 1000 people; Cambodia has <50% of this workforce. So, the question arises who do we have then? Whom can we engage to provide certain services through PC in LMICs? We have the primary health centers (PHCs) and its staff, which are present everywhere in all countries, and everywhere within individual countries. These are government set-ups, are already part of the healthcare system, and PHC staff are the government employees.

Looking at the 2nd prerequisite, in a current arrangement, the responsibility of treatment is always put on the patient, which is unfair in LMIC scenarios. This is because systemic barriers are more important for treatment deficits than patient-related factors. Herewith, we bring a strategy called 'domestic health visiting (DHV)'. Now, we have a SP from the PC (i.e. PHC staff) and a strategy (DHV) that can likely build an active relationship between system and the public.

Methods: We would conduct our assessment of engaging DHV in two Asian neighboring countries-Cambodia and Laos; two districts in each country, fig 1. One district would serve as an intervention (Memot in Cambodia and Pak Ngum in Laos) and another being non-intervention. Memot has 11 PHCs and Pak Ngum has 9 PHCs, 5–6 staff at each PHC. The methodology would be the following as given in fig 2.

Results: The anticipated results are in term of the changes in the: KAP of the PHC staff, treatment coverage, adherence, mortality, income of the patients and the PHC staff, stigma, development of DHV, Mobile phones use, Microfranchisee as three delivery models, among others.

Conclusion: The possible anticipated conclusion is that DHVs are an effective novel strategy to reduce diagnostic, treatment gap as well as the therapeutic follow-up gaps among PWEs in Cambodia and Laos.

SS3: Dementia and Alzheimer's Disease: Prevention, Early Diagnoses and Treatment

SS3-1

ALZHEIMER DISEASE: PRESENT TREATMENT AND RESEARCH FOR FUTURE TARGETS

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Currently available medications improve Alzheimer disease (AD) symptoms. In Europe, three drugs are approved working on the cholinergic system (donepezil, galantamine, rivastigmine) on the indication of mild and moderate AD. In addition, memantine (working as an NMDA antagonist) is approved on

the indication moderate and severe AD. New data indicate that these drugs might have multiple modes of action. In recent years, new ways of administration of these drugs have been developed. Research into AD has been partly successful in terms of developing symptomatic treatments, but has also had several failures in terms of developing disease-modifying therapies. These successes and failures have led to debate about the potential deficiencies in our understanding of the pathogenesis of AD and potential pitfalls in diagnosis, choice of therapeutic targets, development of drug candidates, and design of clinical trials. Many clinical and experimental studies are ongoing, mainly based on anti-amyloid-β (Aβ) strategies, but the exact role played by Aβ in AD pathogenesis is not yet clear. We need to acknowledge that a single cure for AD is unlikely to be found and that the approach to drug development for this disorder needs to be reconsidered. Preclinical research is constantly providing us with new information of the complex AD puzzle, and an analysis of this information might reveal patterns of pharmacological interactions instead of single potential drug targets. Despite the recent negative results of randomized controlled trials (RCTs) on AD, increased collaboration between pharmaceutical companies, basic and clinical researchers will bring us closer to developing an optimum pharmaceutical approach for the treatment of AD. A better understanding of the disease pathogenesis, but also solving methodological problems in clinical trials on AD – eg standardized diagnostic criteria to identify homogenous group of patients, appropriate treatment duration and measures of disease-modifying effects – will help optimizing treatment for AD.

SS3-2

EARLY DETECTION OF ALZHEIMER'S DISEASE

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Early diagnosis of Alzheimer Disease (AD) is of importance to be able to initiate symptomatic treatment with acetylcholine esterase (AChE) inhibitors, and will be of even greater significance when potential disease-arresting drugs, such as Aβ vaccination regimes, reach the clinical phase. Further, cerebrospinal fluid (CSF) biomarkers may also be valuable tools to identify and monitor the biochemical effect of new candidate drugs in AD patients. Since CSF is in direct contact with the extracellular space of the brain, biochemical changes in the brain are likely to be reflected in the CSF. Thus, CSF biomarkers have been developed that reflect the central pathogenic processes in AD, including the neuronal degeneration (total tau, T-tau), the deposition of Aβ in plaques (the 42 amino acid form of Aβ, Aβ42), and the phosphorylation of tau with formation of tangles (phosphor-tau, P-tau). Several hundred studies have shown that these CSF biomarkers have high diagnostic accuracy to identify AD, and to differentiate AD from normal aging and several important differential diagnoses. Recent studies also show that CSF biomarkers may help to identify mild cognitive impairment (MCI) cases that will progress to AD with dementia from those who have a benign form of MCI without progression. Further, there are a high correlation between CSF Aβ42 and PET-PIB and these two markers are seen to be the earliest biomarkers becoming positive in prodromal AD today.

W1/W2: Workshop

W1-1

SLEEP DISORDERS

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We live one third of our lives in sleep; therefore, it does make sense to learn about sleep medicine. Besides, sleep diseases may lead to decreased quality of life, harm, or even death. Sleep disorders are common but they are neglected by patients and physicians. It is important for all physicians to inquire about sleep and its disorders in their patients. The goal of this activity is to educate our colleagues to be comfortable approaching and managing a patient with a sleep complaint. Sleep-wake cycle is an example of a biological rhythm. The interaction between different brain centers would decide what stage we exist in; wake, non-REM sleep, or REM sleep. Many neurotransmitters will act as messengers in the complicated network responsible for determining what stage we are in. Understanding the above processes would be important when a physician approaches a patient with a sleep complaint. Obstructive sleep apnea is the most common sleep disorder seen in sleep labs. It is a relatively common disease encountered in 2% of women and 4% of men. It may lead to a decrease in quality of life, and because of excessive daytime sleepiness it may cause accidents at home, at work, or on the road. Long term sequlae include hypertension, ischemic heart disease, or stroke. Therefore, it is important for any physician to recognize patients with sleep apnea and refer them to the sleep specialist. After evaluation is completed by the last, they have to be comfortable taking care of them. Restless legs syndrome is a common sleep related movement disorder. It is important for any physician to recognize it, to know how to approach and manage it. It's important to know the difference between restless legs syndrome and periodic limb movement disorder. Nocturnal leg cramps is a common condition which occasionally may require drug therapy. Many parasomnias maybe encountered in the clinical practice of a primary care physician and most of the time all, they need is assurance and education. In some cases a referral to a specialist may be needed to differentiate it from a serious condition like epilepsy or to recommend an appropriate drug therapy. It's not uncommon for epileptic seizures to be limited to sleep; in such cases, eliciting the important information by taking a detailed history would lead to the right diagnosis. REM sleep behavior disorder is a rare but interesting condition which is important to recognize, to avoid the potential harm from it for the patient or his spouse. Variable systems from many health care

companies are available to record sleep parameters. Some are used for screening purposes, while others offer a full range sleep study. Advanced technology made portable systems available. Different types of sleep studies will be reviewed. Also principals of scoring and reading a sleep study will be entertained. Some clinical cases will be studied through interactive discussions with the group to apply the knowledge gained from the lectures.

W1-2

DIAGNOSTIC IMAGING OF THE CENTRAL NERVOUS SYSTEM WITH ULTRASOUND

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Ultrasound is well known to be a useful tool for imaging of soft tissue. This method is limited as soon as bone or air is in the course of the sound waves. For decades Ultrasound was used in diagnosis of neurological diseases just to visualize the flow in the intracranial parts of the carotid and vertebral arteries. During the nineties of the last century it was discovered, that Ultrasound can differentiate in about 70–80% of all cases also parenchymal lesions of the brain. It started with the interest for the Substantia nigra in the Pedinculus mesencephali in patients with Parkinson's disease: iron deposits are visible in this disease neither CT nor MRI can show.

W-2

MOVEMENT DISORDERS – VIDEO SESSION

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Objectives: To discuss features of various movement disorders by video presentations.

Introduction: Movement disorders have been known in human history since centuries because of their uniqueness of attracting human attention. A significant number of movement disorders may be diagnosed by inspection of patients. Thus, careful inspection of patients at rest, supine or sitting, with mental tasks, as well as walking may be helpful to diagnose movement disorders.

Methods: Video presentation of a number of movement disorders will be performed in this session to generate discussion of uncommon features of common movement disorders and common presenting feature of rare movement disorders.

Results: The movement disorders phenomenon which can be diagnosed by careful inspection of patients include tremor, dystonia, chorea, myoclonus, and tics. Various diagnoses can be made with vigilant inspection of the patients.

Conclusion: Patients should be inspected very closely and carefully in the assessment of movement disorders.

Neuro
epidemiology

Session O1: Prevention

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PREDICTORS OF OUTCOME IN GUNSHOT WOUNDS OF THE HEAD

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Objective: Civilian gunshot wounds to the head (GSWH) are deadly. Predictors of clinical outcome due to GSWH were analyzed over a 24-month period.

Methods: We posited two questions: 1) What percentage of subjects with GSWH died across the state of Maryland; and 2) What were the predictors of good outcome (GOS) following GSWH? Demographics, clinical, imaging and acute care data of 786 civilians who sustained GSWH were analyzed. Univariate and regression analyses were used to analyze the data.

Results: Of this cohort (N = 786 patients), 594 died at the scene and 122 died following admission to 8 Level I-III Trauma Centers. Seventy patients made it to TBI rehabilitation of which 30 (3.8%) had surgery. From the 69 patients who were admitted to this Level I Trauma Center, 78.6% were male, mean age was 34.8, injury severity score 26.7, GCS 7.1, and abnormal pupillary response to light (APR) was present in 47.4% of patients. CT scan indicated midline shift in 17.5%, obliteration of basal cisterns in 42.5%, intracranial hematomas in 35% and intraventricular hemorrhage in 55% of cases. Two subsets of admissions were studied: (1) 27 patients who died during acute care and (2) 15 patients who had a good outcome when followed a mean of 39 months. Missile trajectory ($p < 0.001$), admission GCS ($p < 0.001$), APR ($p = 0.002$), patency of basal cisterns ($p = 0.01$), age ($p = 0.02$) and intraventricular bleed ($p = 0.03$) had significant relationship with outcome. Stepwise multivariable logistic regression analysis indicated that GCS and patency of basal cistern were significant determinants of outcome. Exclusion of GCS from the regression models indicated missile trajectory and APR were significant players in determining outcome.

Conclusions: GCS at admission, APR to light, patency of basal cisterns and the trajectory of the missile were significant determinants of outcome in civilian GSWH.

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FASCINATING NEW ERA. ATHEROSCLEROSIS IS VASCULAR INFLAMMATORY DISEASE

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Introduction: During last 70 years understanding mechanisms atherosclerosis has changed dramatically, from cholesterol through, LDLs/HDLs', to LDL subfractions (LDL3-7), and recently to specific vascular inflammatory marker-lipoprotein associated phospholipase A2 (LP-PLA2). Where we are now?

Aim: 1. to analyse lipid's spectrum incl LDL subfractions and LP-PLA2 and 2. to correlate them with carotid atherosclerosis in a) arterial hypertension (AH), b) ischemic cerebral stroke (iCI), c) coronary artery disease (CAD) and d) controls (C). Prospective multicenter, multidisciplinary study.

Material and Methods: Material consists of 1286 subjects, divided into four groups: 1. AH (n = 232), mean age 69.7 yrs, 2. CAD, (n = 295), mean age 71.8 yrs, 3. iCI, (n = 304), mean age 72.6 yrs, 4. Controls (C, n = 206), mean age 47.8 yrs. All patients were examined by certified stroke neurologists (NIHS, mRS, BI), cardiologists (NYHA, Holter ECG, ABPM monitoring) neuroradiologist (CT/MR)I, lipid spectrum (LDLs/HDL, inflammatory markers, homocysteine, Carotid stiffness (Sphygmocor (AtCor Sydney), IMT, plaque morphology (USG), LP-PLA2 (ELISA, dia-Dexuss Comp, Ca, USA).

Results: The study showed significantly higher dislipoproteinemia (higher t-Chol., LDL-c, VLDL, lower HDL-c, ApoAI, ApoAII, t-chol/LDL-c ratio. Moreover, there were found higher LDL3-7 subfractions, which are strongly atherogenic. Some individuals showed high t-chol.level +higher LDLs but normal values in LDL3-7. These can be considered as, low risk for AS'. Another individual showed normal t-chol+normal LDLs, but high values in LDL 3-7. These can be considered as 'high risk of AS'. The most attractive findings: significantly higher levels of LP-PLA2, mainly in plaque ulcer in all followed groups (AH, CAD, iCI) comparing to controls ($p < 0.02–0.0001$). Moreover, significant close correlation between these findings and carotid atherosclerosis, mainly plaque rupture were documented ($p < 0.001$).

Conclusion: This prospective multicenter and multidisciplinary study showed 1. a significant association between specific inflammatory marker-Lp-PLA2 and various stages of AS in AH, CAD and iCI 2. significant association with carotid atherosclerosis and plaque morphology These changes are starting early, in time of AH and are not specific for iCI 3. LP-PLA2 represents new

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ASYMPTOMATIC CAROTID STENOSIS. WHAT IS THE BEST APPROACH? CEA AND/OR CAS? OR RECENTLY PREFERED MEDICAL PREVENTION? CRITICAL OVERVIEW

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Introduction: The fighting between CEA and CAS continues, mainly regarding asymptomatic carotid stenosis (ACS). Now we have new possibility – 'best medical therapy'. What should we advise the patients?

Aim: 1. to analyse controversies between CEA, CAS and medical prevention in ACS. 2. critical overview regarding these three possibilities.

Material and Methods: Data from Cochrane, EMBASE, SCI, PubMed, all Trials (1993–2013), ovn studies (CEA = 486, CAS = 242), leader expert's opinion (2011–2013).

Results: For present, CEA represents 'the gold standard' for symptomatic and ACS. CAS offers an alternative to CEA. CAS showed greater efficacy in younger ages, CEA in older ages. Last results showed that CAS is viable alternative to surgery'(2013). Until now, better results using CEA, comparing CAS still exist. For decision, which of these procedures to use, it is necessary to take into account various conditions: 1. is >70% degree of carotid steniosis enough valid for our decision?, 2. the impact of plaque morphology, 3. different devices and neuroprotection for CAS, 4. comorbidities. 5. patient's age, etc. During last years, the results of' best medical therapy' have changed our approach dramatically, the annual stroke rate has fallen to <1%. Advent of this therapy, led to its increasing use and to improved medical management. Conversely, stroke risk after carotid revascularization remained unchanged. Medical prevention seems to be more effective than CAS and CEA. Comprehensive medical prevention (platelets, statins, BP regulation, etc) has shown significant decreasing in annual stroke rate in AHGCAS pts to 0.34%. Despite of these results, controversies which of these three possibilities is the best, remain.

Conclusions: 1. For present, benefit of CAS over 'best medical therapy' in patients with ACS is unproven. Best medical therapy should be always considered. 2. Despite some outstanding neurologists are calling for stopping CAS in ACS, in our opinion without pioneers, it doesn't exist progress, and without trialists, it doesn't exist proof. We need both, pioneers and trialists. Supported by EU/govern.grantsITMS26220220153, ITMS26 220220099, LPP0186-06, APVV0586-06.

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CAROTID INTIMA-MEDIA THICKNESS IN PARKINSON'S DISEASE PATIENTS WITH DYSKINESIA

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Objective: To determine whether patients with Parkinson disease (PD) treated with L-dopa have thicker carotid intima-media thickness (IMT) compared to ones without this motor complication.

Background: Hyperhomocysteinemia as a risk factor of atherosclerosis is frequently reported in PD patients treated with L-dopa. Dyskinesia as one of the motor complications of L-dopa treatment is attributed to the elevated level of homocysteine. We used carotid IMT, a measure of atherosclerosis, to evaluate this association.

Method: In this cross-sectional study we compared average IMT of both Common Carotid Arteries (CCAs) and Internal Carotid Arteries (ICAs) and mean value of these two parameters (mean IMT) in two groups of PD patients: with and without dyskinesia. PD patients older than 70 years old and with vascular risk factors and those taking L-dopa less than 12 months were excluded.

Results: Sixty PD patients (23 with dyskinesia; average age 46.9 ± 6.7 years and 37 without dyskinesia; average age 55.4 ± 12.9 years) were recruited. The average IMT of both CCAs was significantly thicker in patients with dyskinesia than those without dyskinesia after adjusting for age as a covariant (0.723 ± 0.111 mm vs. 0.671 ± 0.204 mm, P = 0.01). Similar results were found for average IMT of both ICAs (0.720 ± 0.090 mm vs.0.687 ± 0.191 mm, P = 0.04) and mean IMT (0.720 ± 0.090 mm vs. 0.689 ± 0.206 mm, P = 0.02).

Conclusion: Our results put forward this possibility that atherosclerosis may play a role in pathogenesis of dyskinesia in PD patients treated with L-dopa.

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ANXIETY AND DEPRESSION CORRELATES IN SAUDI VICTIMS OF SPINAL CORD INJURY

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Introduction: The prevalence and cost of Physical Trauma is a major physical and mental health care problem worldwide and particularly in the Saudi Arabia today. Fifty million persons in the world are estimated to be injured or disabled by traffic crashes, the leading cause of traumatic spinal cord injury (TSCI) (World Health Organization [WHO], 2004). TSCI is a devastating and common neurological disorder that has profound influences on psychological and social lives of the victims this decade has been labeled as the decade of the Spine to emphasize the importance of

spinal cord injury and other spinal disorders. Anxiety and depression can have devastating effects on an individual with a spinal cord injury). Depression can be a major factor in the higher utilization of health services and can be connected with suboptimal functional gains, increased complications such as pressure ulcers and urinary tract infections, compromised immune function, increased LOS, increased medical expenditures, decreased social integration, compromised intimate relationships, and strained caregiver support. The comorbidity of anxiety, depression and spinal cord injury can prove lethal. For this reason, it must be assessed hastily and addressed with skill, knowledge, and competence. It is important that clinicians are able to detect clinical levels and risk factors of anxiety and depression in individuals with TSCI, particularly at vulnerable times, in order to help these individuals maximize their improvements in rehabilitation and psychological wellbeing. Moreover, effective screening and early intervention and management of anxiety and depression will undoubtedly be beneficial to services in terms of bed space and cost.

Aim: goal of the presentation is to advance the current literature on acute Traumatic Spinal Cord Injury patients by assessing the association between psychological variables (i.e. anxiety and depression) and several sociodemographic and injury-related risk factors (i.e. age, gender, level of injury, educational level, pain, and smoking) in the Arab population.

Methods: We conducted a cross-sectional study from November 2009 to April 2011, in 102 TSCI patients admitted to the Spinal Cord Injury Unit, Sultan Bin Abdulaziz Humanitarian City, Riyadh, Saudi Arabia. We used the Hospital Anxiety and Depression Scale (HADS) to measure the level of anxiety and depression of the study population.

Results: Compared to male TSCI patients, the level of anxiety ($p = 0.0001$), depression ($p = 0.0045$), and total HADS ($p = 0.0002$) scores were significantly higher in females. The correlation between level of education and anxiety and depression showed that patients with a university education had higher anxiety ($p = 0.0115$), depression ($p = 0.0437$), and total HADS ($p = 0.0272$) than patients with a lower education level. The TSCI patients with pain reported more anxiety and depression than patients who did not have pain. Compared to nonsmokers, the smokers showed marked but insignificant higher levels of anxiety and depression.

Conclusion: Women with TSCI are at a significantly higher risk of having anxiety and depressive symptoms. Level of university education was modestly correlated with higher level anxiety and depression in this population.

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EPIDURAL HEMATOMAS IN PADDLE SPINAL CORD STIMULATORS

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Objective: The use of paddle spinal cord stimulators is increasing, yet little information is available on its most catastrophic complication namely development of an epidural hematoma. The goal of this presentation is to review our cases and analyze this complication.

Method: The clinical data on all the patients who underwent implantation of a paddle spinal electrode stimulator for pain control since 2003 were reviewed and the patients who developed a postoperative paraparesis or paraplegia were contacted for follow up and to extract more information regarding the circumstances associated with this complication.

Results: There were 90 patients with 5 in the cervical spine and the remaining 85 in the thoracic spine. Two patients developed paraplegia and one patient had unilateral monoparaparesis. The incidence was therefore 3/90 or 3.3%. None of those three had a risk factor for increased bleeding and in none was there a difficulty with hemostasis at surgery. The onset of symptoms was at 1, 4.5 and 6 days after surgery. All three patients were taken immediately to surgery without imaging in order not to lose any time and an epidural hematoma was found and evacuated in each patient. All patients improved but did not go back to normal. One patient with paraplegia that occurred 4.5 days after surgery was ambulating with a walker at 13 months postoperatively, he died of urosepsis as a consequence of his cord injury. The other patient with paraplegia developed her symptoms at 6 days after surgery and regained walking with only mild weakness of the anterior tibialis muscle group and had another paddle spinal cord stimulator implanted at about 3 months after the first implantation. She died of preexisting cardiac disease. The patient with residual monoparesis had developed her symptoms at one day postoperatively and was alive at 16 months of follow-up.

Conclusions: 1. Implantation of a spinal cord stimulator is not an innocuous procedure as it leads to paraplegia or paraparesis in 3 out of 90 patients or 3.3% of this series. 2. Patients and families should be clearly instructed about the extreme importance of immediately reporting the first symptoms of cord compression so that surgery is done as quickly as possible. 3. All three complications occured inspite of perfect hemostasis.

Session O2: Diagnosis

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A MATTER OF APPLYING APPROPRIATE DIAGNOSTIC CRITERIA – WHY WE MIGHT UNDERESTIMATE THE INCIDENCE OF CREUTZFELDT-JAKOB DISEASE IN THE VERY OLD

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Background: In contrast to other neurodegenerative diseases, sporadic Creutzfeldt-Jakob disease (sCJD) is rarely diagnosed in patients older than seventy-five years. Reasons have been

discussed for many years, but data describing the characteristics of sCJD in the very old are rare and inconclusive. Therefore a historical cohort study was designed within the German national reference centre database to evaluate clinical, CSF and MRI features of this distinct group.

Methods: Seventy-three patients older than 75 years identified via the German surveillance program in the years 2001 to 2012 were compared to seventy-three sCJD patients younger than 75 from the same time period. Groups were compared with respect to clinical, CSF and MRI characteristics using Wilcoxon Rank sum tests, Fisher's exact tests and Kaplan-Meier curves and multivariate logistic and Cox regression models as appropriate.

Results: Groups did not differ from each other considerably with respect to demographic characteristics or CSF profiles. In early stages of disease, older patients presented slightly more often with dementia ($p = 0.127$) or dyarthria ($p = 0.138$), whereas disorders of the extrapyramidal ($p = 0.046$) and visual system ($p = 0.015$) were more common in the younger group. Younger patients showed a slower disease progression represented by a longer overall survival time (5.6 vs. 3.5 months in median, $p < 0.001$) and a later point of diagnosis (3.0 vs. 2.1 months from first symptom, in median, $p < 0.001$). Patients older than 75 years presented more often with atypical MRI profiles. Unilateral MRI lesions and lesions restricted to cortical regions only were more common in the very old ($p < 0.001$), whereas a combination of typical cortical and basal ganglia hyperintensities could be found more often in the younger group ($p < 0.001$).

Discussion: In the present study it could be shown for the first time that patients with late-onset sCJD differ from younger CJD patients with respect to MRI profiles and initial clinical presentation but not CSF markers. Underestimation of CJD cases older than 75 years seems likely due to atypical clinical and radiological presentation and might contribute to lower sCJD incidence rates in individuals older than 75 years.

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AETIOLOGICAL FACTORS AND PRECIPITANTS OF EPILEPTIC SEIZURES IN NIGERIAN AFRICANS: HOSPITALS-BASED STUDY FROM KADUNA STATE, NORTHERN NIGERIA

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Background: Epilepsy is a common neurological illness in Nigeria, with a prevalence of 5–37 per 1,000 in a rural population. Several studies suggest that the prevalence of epilepsy is higher in developing than developed countries due to the presence of more harmful environmental factors. This study determined the aetiological factors of epilepsy and precipitants of epileptic seizures in Kaduna State, Northern Nigeria from October 2008 to April 2013.

Patients and Methods: Two hundred and forty two consecutive adult patients with history of at least 2 unprovoked afebrile seizures were interviewed for historical details of seizure patterns, aetiology and precipitants of seizures, usually in collaborations with their parents, guardians, spouses or relatives. Thereafter they were subjected to physical and neurologic examinations. Seizure patterns were confirmed by electroencephalogram in all the patients, while aetiological factors were confirmed by brain imaging in 65% of them.

Results: The male to female ratio of study population was 3 (69%): 1 (31%), with respective mean ages of 29.5 ± 12.4 and 30.7 ± 16.0 years. Their respective mean ages at occurrence of first seizure were 18.6 ± 14.0 and 20.9 ± 17.4 years. 88% of seizures were of focal origin (complex partial, 80%; simple partial, 8%); although the causes and precipitants were unknown in 41% and 68% of cases respectively.

Conclusion: Although majority of epileptic seizures in Northern Nigeria are of focal origin, their causes and precipitants remain largely unknown.

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TCD IN CEREBRAL REVERSIBLE VASOCONSTRICTIVE SYNDROME ASSOCIATED WITH ELEVATED INTRACRANIAL PRESSURE, A NOVEL FINDING

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Reversible cerebral vasoconstrictive syndrome (RCVS) is an interesting clinical entity with wide spread vasoconstriction and cerebral dysfunction. The exact mechanism is unknown but if not treated well, RCVS can progress to cerebral infarcts. We present 2 cases in which Transcranial Doppler (TCD) was done on patients diagnosed with RCVS, demonstrating evidence of elevated intracranial pressure, which was confirmed by lumbar puncture. The presence of elevated intracranial pressure in patients with RCVS is a novel finding, and would add to our understanding of the spectrum of the patholphysiological processes involved in this newly recognized, poorly understood disease process.

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SERONEGATIVE LONGITUDINAL EXTENSIVE TRANSVERSE MYELITIS IN KOREAN MALES; IS IT RELATED WITH TOXOCARIASIS?

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Background: Longitudinal extensive transverse myelitis (LETM) is defined as a spinal cord lesion that extends over three or more vertebrae. Whilst LETM is a classically associated with

NMO, there are many other causes. Clinical and laboratory characteristics of LETM in Korea remain to be elucidated.

Methods: We retrospectively reviewed medical records and spinal MRIs of 59 Korean patients who were diagnosed with LETM. All patients completed test for anti-aquaporin 4 antibody (AQP4-Ab) using cell-based indirect immunofluorescence assay. We compared clinical, laboratory and radiological features between patients with AQP4-Ab-positive and negative LETM.

Results: Among 59 patients with LETM, 33 (56%) were seropositive for AQP4-Ab and 26 (42%) were male. Seronegative group showed a higher male to female ratio compared with seropositive group (male to female, 18:8 vs. 8:25, $p = 0.001$) and shorter vertebral segment involvement of spinal cord lesions (4.8 ± 3.1 vs. 9.2 ± 5.5, $p = 0.000$). Toxocara canis antibodies were more frequently observed in seronegative group than seropositive (15/26 vs. 2/32, $p = 0.000$), whereas autoimmune antibodies were more frequently detected in seropositive group (66.7% vs 30.8%, $p = 0.006$).

Conclusion: We should consider other inflammatory causes beside NMO in seronegative Korean male patients with LETM. Toxocariasis may be considered as one of the important etiologies.

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DSM-5 THE NEW DIAGNOSTIC SYSTEM IN NORTH AMERICA: EVOLUTION AND EPIDEMIOLOGICAL APPLICATIONS

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Objectives: Diagnosis of mental health conditions continues to rely on subjective clinical assessments, and therefore periodic revisions seeking improvement and more precision are required. Very recently, DSM-5 the new diagnostic system in North America, was formally released to replace DSM-IV, a process marked by interesting controversies. This presentation will introduce DSM-5 and discuss epidemiological applications of the new criteria.

Method: The author was a member of the task force from the American Psychiatric Association (APA), including about 25 academic psychiatrists that coordinated this process, so he can provide an insider's view on the development of DSM-5. The process of developing the new diagnostic system took more than 10 years and included a great deal of international collaboration. Following a detailed, rigorous process, new diagnoses were proposed by working groups and approved or rejected by oversight committees.

Results: DSM-5 was released at the end of May 2013, at the annual meeting of the APA. It is defined as a 'living' document, a draft in need of improvement that can be modified and revised as needed. DSM-5 includes 3 sections. Section 2 is the central one and it includes a few new diagnostic entities as well as important modifications/improvements to existing diagnoses of relevance to psychiatry, neurology and medicine. A new section of the diagnostic manual, section 3, includes interesting new diagnoses not ready for 'prime time' that need to be tested further as well as some dimensional approaches to psychiatric diagnosis. We are also currently working on the developing of a primary care version of DSM-5 that would include about 30 diagnoses relevant to primary care.

Conclusions: Field trials showed that DSM-5 diagnoses performed fairly well. Clinicians found the DSM-5 diagnoses more user friendly than those of previous versions (DSM-IV) and the criteria is being broadly implemented both inside and outside the United States. The author will also report on international DSM-5 studies he has collaborated in, and will provide some hints for future epidemiological research using DSM-5 criteria that will use internationally tested instruments (SCAN-PSE). He will also provide an update on the controversy and debates related to the release of the new instrument in the United States.

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VALIDATION OF THE ARABIC ROWLAND UNIVERSAL DEMENTIA ASSESSMENT SCALE (RUDAS) IN ELDERLY WITH MILD AND MODERATE DEMENTIA

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Background: Validated screening tests for dementia in Arabic are lacking. Given the low levels of education among older people in the Middle East and North Africa region, the commonly used screening instrument, the Mini Mental Status Exam is not best suited because it requires arithmetical ability, reading and writing skills. The Rowland Universal Dementia Assessment Scale (RUDAS) alternatively minimizes the effects of cultural learning and education (1). RUDAS has been cross-culturally validated and has shown good psychometric properties with low education levels (2). The aim of our study was to validate the RUDAS in Arabic and evaluate its performance for mild and moderate dementia.

Methods: 244 participants older than 65 years were recruited from social organizations, primary care community clinics and hospital-based specialist clinics: 142 controls and 100 cases; of which, 53 had mild dementia and 47 had moderate dementia. Clinicians used DSM_IV (Diagnostic and Statistical Manual of Mental Disorders, Fourth edition) criteria in their diagnosis, and rated dementia severity using Clinical Dementia Rating Scale. Interviewers blind to the cognitive status administered the RUDAS. The psychometric properties of the Arabic RUDAS were examined.

Results: Using the recommended cutoff of 22/30, the Arabic RUDAS exhibited good sensitivity (84.0%) and specificity (84.5%). Its positive predictive value (PPV) was 79.3%, and a ROC area of 0.84. When participants were stratified by dementia severity, sensitivity and ROC area improved for those with moderate dementia.

Conclusion: This short scale can be recommended for screening dementia in clinical practice and in research in Arabic speaking populations with high level of illiteracy.

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BLINK REFLEX AND BRAIN DEATH

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Background: Brain death (BD) represents a challenge for physicians in general and neurologists in particular. There are no diagnostic standardized criteria, and the diagnosis is primarily clinical. Ancillary tests are used to confirm clinically established brain death. Blink reflex is one of the brain stem reflexes could have a place in such situation.

Objectives: Study the evoked blink reflex responses in brain death. 1) Demonstrate that evoked blink reflex responses are absent in the brain stem death while preserved in severe encephalopathy. 2) Consider BR recording in the guideline for the diagnosis of the brain stem death.

Material and Methods: BR was done in 2 groups of patients: 1st group: 42 patients in whom clinical & EEG patterns are consistent with brain death 2d group: 28 patients, with severe encephalopathy of variable causes

Results: In the BD patients group, 26 Women & 16 men aged between 25 and 72 years (mean age: 48.9) were included. All patients had irreversible arrest 1–27 days after BR. BR responses, mono- & polysynaptic, ipsi- & contralateral, have been absent in all patients. In the second group (encephalopathies with no BD) responses were recordable in all cases however, abnormalities such as reduced amplitude and absent contralateral R2 have been inconsistently observed. Recordable response correlate with the clinical status indicating preserved brainstem functions.

Discussion: The clinical diagnosis is based on the absence of all brain stem reflexes in deeply comatose non reactive patients. Ancillary tests, used to confirm the clinical diagnosis, include imaging of cerebral blood flow and nuclear brain scanning however, they may have limitation in clinical practice. EEG, the most used test, and evoked potential (EP) including mutimodalities EP are useful in spite of their limitations. BR has never been proposed for the diagnosis of brain death. All responses are abolished in all cases diagnosed brain death, and they are recordable and reproducible in all encephalopathy cases with preserved brain stem functions.

The results are consistent and indicate that BR test may help to confirm the diagnosis of brain death. The test is easy in clinical practice and may be done quickly at bedside. It has limitations, as other neurophysiology tests. Absent responses may be due to focal brain stem lesion or peripheral dysfunction (trigeminal and/or facial neuropathies). The diagnosis of BD could not be confirmed when Responses are recordable.

Conclusion: BR responses are abolished in the BD with maintained cardiovascular functions BR, a simple & easy test, is a valuable test that should be considered to support the clinical diagnosis of the brain stem death.

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ASSESSMENT OF PATHOGENIC SAPS IN HEXA AND HEXB GENE USING PUBLICALLY AVAILABLE IN SILICO TOOLS: A ROADMAP FOR NEUROEPIDEMIOLOGISTS

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Tay-Sachs disease and Sandhoff is a rare autosomal recessive disorder caused by the mutations in the HEXA and HEXB gene on the chromosome 5 and 15. Rapid development in various technologies and cost effective genotyping methods have generated a vast amount of data on single amino acid polymorphisms (SAPs). Scientists face a major hurdle in the identification and functional characterization of disease associated SAPs from a pool containing both harmful and neutral ones. This categorization of SAPs can aid in better understanding of genotype/phenotype relationships and drug response to disease which revolu-tionized the field of individualized medicine. Owing to severity of the Tay–Sachs and Sandhoff disease and its frequency of occurrence in HEXA and HEXB gene mutations, we conducted the first single amino acid polymorphisms analysis via bioinformatics pipeline to unravel functional SAPs that can alter the gene function. We applied combination of sequence (SIFT, PhD-SNP, FATHMM-Pred and PANTHER) and structure based (PolyPhen-2, SNAP and SNPS&GO) evolutionary approaches which are solely based on evolutionary sequence information to prioritize high risk the functional SAPs. In addition, protein stability, evolutionary conservation patterns and biophysical validation of the proposed impact of SAPs on protein structure and function was observed using I-mutant 3, ConSurf Web server and align GVDV. Furthermore, to understand the atomistic level changes and the dynamic behavior of the molecule with respect to the harmful mutations, we conducted Molecular Dynamics (MD) simulations analysis on protein structure. In the absence of experimental or epidemiologic evidence, the potential functional consequence of a SNP in intronic region and exonic 5' and 3' untranslated region (UTR) (SNPs) was identified using FASTSNP and F-SNP. We hope combination of various in slico methods can help in better understanding Tay–Sachs and Sandhoff disease and also able to prioritize the functional SNPs for further genotyping. Overall, this cost effective and time minimizing theoretical approach has the ability potential to create personalized tools for the diagnosis, prognosis and treatment of neurodegenerative disorder.

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POST-STROKE SEIZURES-DATA FROM POPULATION-BASED STUDIES IN KOLKATA, INDIA

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Introduction: In the aftermath of stroke, epileptic seizure may occur due to the cerebral dysfunction. Post-stroke seizure could be early or late. The early post-stroke seizure that occurs within 7 days of stroke event has a low propensity to develop epilepsy subsequently. The early post-stroke seizure falls within the ambit of 'acute symptomatic seizure'. An epileptic seizure occurring beyond the first week of stroke has a significant tendency to develop into epilepsy. Hospital-based data from Indian subcontinent showed that 5–13% of the stroke cases develop post-stroke seizure. But so far no population-based Indian data on post-stroke seizure disorder is available.

Aim: This population-based study aims to determine the incidence of 'post-stroke seizure disorders' in the city of Kolkata, India.

Method: Population-based prospective surveys were conducted among stratified, randomly selected 52,377 inhabitants in the city of Kolkata, India. This sample population was surveyed bi-annually using 2-stage method from 2003 through 2008, simultaneously for Stroke and for Epilepsy.

Result: Out of 66 incident cases of epilepsy, there were 12 (18.18%) with post-stroke epilepsy. On the other hand, of the 30 incident stroke survivors 5 (16.7%) had post-stroke acute symptomatic seizures and 3 (10%) developed post-stroke epilepsy.

Discussion: In the western countries, 11% of epilepsy and all unprovoked seizures have cerebro-vascular disease as the underlying cause. Five percent of stroke cases in the western nations develop post-stroke epilepsy. In comparison, our study showed higher incidence of post-stroke epilepsy.

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RISK FACTORS FOR EPILEPSY IN NIGERIAN AFRICANS – A CASE CONTROL STUDY

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Aim: The goal of lowering incidence of epilepsy is particularly pertinent to sub-Saharan Africa where prevalence and incidence rates are high. The identification of risk factors that predispose to development of epilepsy is crucial to its primary prevention therefore this study evaluated the risks conferred by some predisposing factors.

Methods: This cross sectional analytical study assessed the relative contributions of various risk factors to development of epilepsy in 244 adult Nigerians with epilepsy compared with an equal number of age and sex-matched controls. Structured interview schedule and in-depth interviews were used to obtain demographic information and previous history of risk factors from study participants and their parents respectively. The strength of association between the risk factors and occurrence of epilepsy was determined with 2 x 2 contingency tables yielding the corresponding odds ratios.

Key Findings: Birth asphyxia (odds ratio of 6.87), recurrent childhood febrile convulsions (odds ratio of 5.74), CNS infections (odds ratio 3.38), head trauma (odds ratio 1.82), rural dwelling without health care access (odds ratio 2.44) and history of epilepsy in first degree relatives (odds ratio 3.44) were identified as significant risk factors for epilepsy while sickle cell disease and childhood immunizations were not. Significance these predisposing risk factors are preventable. Improvement in antenatal and perinatal care services, prompt diagnosis and appropriate treatment of febrile diseases and CNS infections, use of head helmets and car seat belts and access to health facility in rural settlements would aid in lowering incidence of epilepsy.

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TOTAL AND LDL CHOLESTEROL AS RISK FACTOR OF ISCHEMIC STROKE IN EMIRATI PATIENTS

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The role of total and LDL-cholesterol as independent risk factors of ischemic stroke remains uncertain. The aim of this hospital based prospective observational study is to investigate the association between total and LDL cholesterol levels and ischaemic stroke in Emirates patients admitted to hospital between June 2007 and June 2009 with atherothrombotic stroke. One hundred and seventy one Emirati patients, 89 males and 82 females with acute ischemic stroke were diagnosed and investigated for risk factors, including hypertension, diabetes mellitus, cardiac diseases, cigarettes smoking and past history of transient ischemic attack (TLA) and past history of stroke. Exclusion criteria were patients with acute or chronic atrial fibrillation and patients receiving 'statins'. Brain CT scan, echocardiogram and carotid ultrasound were done on hospital admission. One hundred and twelve patients (65.5%) had hypercholesterolemia (total cholesterol level >5.2 mmol/L, LDL cholesterol >4.2 mmol/L). One hundred and thirty patients (76.0% were hypertensive. Ninety patients (52.8%) were diabetic. Twenty two (12.9%) were heavy smokers. Fifty patients (29.2%) had past history of cardiac disease. Twenty eight patients (16.4%) had previous stroke twelve patients *12%) had TLA. Out of the one hundred and twelve patients with hypercholesterolemia nine patients (5%) only had isolated hypercholesterolemia. The commonest risk factor associated with hypercholesterolemia is hypertension (78.8%). In con-

clusion, the results of this study do not support the association between isolated hypercholesterolemia and atherothrombotic stroke. Hyperchlesterolemia is not an independent risk factor for ischaemic stroke but it can interact with other risk factors mainly hypertension to promote atherosclerosis.

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INCIDENCE OF NEUROBORRELIOSIS-ASSOCIATED CEREBRAL VASCULITIS IN GERMANY

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Background: The cerebral vasculitis is one of the rare life-threatening manifestations of neuroborreliosis, which often leads to fatal or disabling strokes. Until now only indirect estimations of the incidence of neuroborreliosis-associated vasculitis and no epidemiological studies in this field have been available. The goal of our epidemiological study was to estimate the incidence of neuroborreliosis-associated cerebral vasculitis and related ischemic complications in German population.

Methods: A population-based prospective study of all incident cases of neuroborreliosis-associated cerebral vasculitis in the region of Eastern Saxony/Germany (622.100 inhabitants) as performed between 1997 and 2011 (9.331.500 person-years). The diagnosis was made based on the diagnostic criteria for cerebral vasculitis and neuroborreliosis as a result of comprehensive diagnostic procedures, including cerebrospinal fluid/serum analytics, MR-imaging, MR-angiography, doppler sonography and conventional angiographie. All patients were followed up prospectively for at least 5 years.

Results: The crude incidence rate of neuroborreliosis-associated vasculitits in study region amounted to 1.17 per 1.0 million inhabitands. The age-adjusted incidence rate of neuroborreliosis-associated vasculitits was 1.19 pro 1.0 million inhabitants in Eastern Saxony or 1.14 pro 1 million inhabitants in Germany. Cerebral vasculitis led to ischemic strokes in 81% and to transient ischemic attacks in 9% of patients. Approximately 64% of patients experienced recurrent ischemic events. In 18% of cases, basilar artery thrombosis was diagnosed. The mortality of neuroborreliosis-associated cerebral vasculitis was 9%.

Conclusions: To the best of our knowledge, it is the first epidemiologic study on the incidence of the neuroborreliosis-associated cerebral vasculitis. This rare manifestation of cerebral neuroborreliosis has a remarkably increased risk of ischemic stroke, which can occur recurrently in the majority of cases. Further epidemiological studies in different regions of the world are required to improve the diagnostics and therapy of neuroborreliosis-associated cerebral vasculitis.

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THE SHANGHAI AGING STUDY: RATIONALE, STUDY DESIGN, PARTICIPATION, AND BASELINE CHARACTERISTICS

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Background: To establish a prospective cohort to enumerate the prevalence, incidence and risk factors for dementia and mild cognitive impairment (MCI) among individuals aged ≥60 years residing in an urban community of Shanghai, China.

Methods: Participants received workups including measurement, demographic and life style questionnaires; physical and neurologic examinations. Based on Chinese culture, we translated, adapted and normed neuropsychological tests from western countries. We demonstrated a 1.5 SD cutoff using corrections for sex, age, and years of education. The neuropsychological battery comprised the following tests and domains: 1) Mini Mental State Examination, 2) Conflicting Instructions Task (Go/No Go Task), 3) Stick Test, 4) Modified Common Objects Sorting Test, 5) Auditory Verbal Learning Test, 6) Modified Fuld Object Memory Evaluation, 7) Trail-making test A&B, and 8) RMB (Chinese currency) test. Test 1–4, 5, 7 were used for subjects with education of at least 6 years. Test 1–4, 6, 8 were used for subjects with education less than 6 years. Diagnoses of dementia and MCI were made using standard criteria via consensus diagnosis. Dementia were diagnosed using DSM-IV criteria. Only those who were not diagnosed with dementia were considered for a diagnosis of MCI. MCI was defined according to the following criteria. 1) cognitive concern or complaint by the subject, informant, or nurse or physician, with CDR = 0.5; 2) objective impairment in at least one cognitive domain based on the average of the scores on the neuropsychological measures within that domain and a 1.5 SD cutoff using data previously validated in the Chinese population; 3) essentially normal functional activities (from the CDR and the ADL); and 4) absence of dementia (DSM-IV). Based on cognitive test scores, subjects diagnosed with MCI were placed into one of four groups characterizing their cognitive deficits: amnestic MCI single domain (aMCI-SD); amnestic MCI multiple domains (aMCI-MD); non-amnestic MCI single domain (naMCI-SD); non-amnestic MCI multiple domains (naMCI-MD). Urine and blood sample were collected, aliquoted, and stored. Biochemistry tests were performed and DNA was extracted for Apolipoprotein (APOE) genotyping.

Results: Among 3,141 participants aged ≥60 years, 1,438 (45.8%) were men. The average age of participants was 72.3 years (SD 8.1), and they had an average of 11.6 years (SD 4.4) of education. The most common chronic disease of participants was hypertension (56.4%). The frequency of APOE-ε2, ε3 and ε4 were 7.9%, 82.7% and 9.4%, respectively. We diagnosed 156 (5.0%) and 601 (19.1%) participants with dementia and MCI. The proportions of MCI subtypes were: aMCI-SD, 38.9%; aMCI-MD, 26.5%; naMCI-SD, 25.0%; and naMCI-MD, 9.6%.

Conclusions: The Shanghai Aging Study is a first prospective community-based cohort study of cognitive impairment in China, with a comparable study design, procedures and diagnostic criteria of dementia and MCI to most previous cohort studies in developed countries.

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ARE STROKES IN YOUNG POPULATION GETTING COMMONER?

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Objectives: Stroke in young used to be uncommon but in recent years this trend is changing. Loads of younger age group patients are presenting with strokes, this is probably because of sedentary lifestyle, consumption of high calorie foods and possibly genetics factors also play a role. This population has different etiopathogensis as compared to older groups. We set out to identify the risk factors and etio-pathogensis to see why in this group of population strokes are getting commoner?

Methods: Consecutive patients aged 18–50 years admitted with acute stroke from January to December 2012 were identified from Stroke Unit Database. The data obtained include demography, risk factors, clinical, neuroimaging and laboratory findings.

Results: Out of 281 patients admitted, 51 (18%) presented with acute stroke, aged 18–50 years were identified. Forty two patients (82%) had the diagnosis of acute ischemic stroke or Transient Ischemic Attack (TIA), while nine patients (18%) had the diagnosis of intracranial hemorrhage. Of the ischemic patients, thirty two patients (76%) were male. Thirty one patients were of Asian and the rest were of Arab origin. Risk factors identified for acute ischemic stroke and TIA were; homocysteinemia, (59%), obesity (50%), smoking and hypertension (43%) each, hyperlipidemia (41%), diabetes mellitus (24%), prior stroke or TIA (14%) and alcohol consumption (9%). Cardiac reasons included ischemic heart disease, cardiomyopathy, atrial fibrillation and intracardiac thrombus seen in up to 16% of cases. Less commonly hematological reasons included connective tissue disorders, protein S deficiency, Factor V Leiden mutations, anti-thrombin III antibodies, anticardiolipin antibodies, lupus anticoagulant and antinuclear antibodies were also seen. Few patients were on contraceptive bills and hormonal therapy for body building. Large vessel involvement was seen in 62% of patients and small vessel in 38% of patients. Majority of patients 64% had National Institute of Health Stroke Scale (NIHSS) >5–23, 29% had NIHSS of <4 and 7% had NIHSS of >24. On discharge, 69% had modified Rankin Scale (mRS) of <2, 24% had mRS of 3–5 and mRS of 6 was seen in three patients. Eight patients (19%) received intravenous thrombolytic therapy and one had mechanical thrombectomy with solitaire retrieval as she had GI hemorrhage.

Conclusions: We report that stroke in young is getting commoner in our population. Modifiable risk factors such as homocysteinemia, smoking, hypertension and hyperlipidemia should be addressed. Large population based primary prevention studies are needed to address this issue so future stroke morbidity and mortality can be reduced.

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INDONESIA STROKE REGISTRY

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Background: Indonesia Basic Health Research 2007 on 33 provinces showed that prevalence of stroke was 8.2 per 1,000 population, and the highest prevalence came from province of Aceh (16.6/‰). Stroke was also the number 1 killer in Indonesia (15.4%), followed by tuberculoses (7.5%), hypertension (6.8%), trauma (6.5%), and coronary heart disease (5.1%). On October 2012, Indonesian Neurological Association and Department Ministry of Health Republic Indonesia started doing epidemiology hospital-based research on stroke in 11 hospitals in Java, Bali and West Sumatra (city of Padang).

Methods: Prospective observational study was carried out from October 2012 until April 2013 using standardized Stroke Case Report Form. 11 hospital involved in this epidemiology research, namely Dr. Cipto Mangunkusumo hospital (Jakarta-Capital of Indonesia), Dr. Hasan Sadikin Hospital (Bandung-West Java), Dr. Soetomo Hospital (Surabaya-East Java), Dr. Kariadi Hospital (Semarang-Central Java), Dr. Sardjito (Jogjakarta-Central Java), Sanglah Hospital (Bali), National Stroke Hospital (Padang, Bukittinggi-West Sumatra), Dr. M. Djamil Hospital (Padang-West Sumatra), Bethesda Hospital (Jogjakarta-Central Java) Mardi Rahayu Hospital (Kudus-Central Java), Reksodiwiryo Army's Hospital (Padang-West Sumatra).

Results: 1807 stroke patients collected from October 2012 – April 2013, Ischemic stroke accounted for the majority of cases (67.1%) and hemorrhagic was 32.9%. and hypertension is the most common risk factor for both hemorrhage (71.2%) and ischemic stroke (63.4%), followed by diabetes mellitus (23.6% in ischemic, 9.6% in hemorrhage) and dyslipidemia (15.7% in Ischemic and 9.6% in hemorrhage). Mortality was recorded 20.3% death after 48 hours, 18.3% ≤48 hours in stroke hemorrhage, compared with 8.3% death in stroke ischemic after 48 hours, 3.5% ≤48 hours. Data of recurrence stroke showed relatively high in both types 33.3% for ischemic and 26.4% in hemorrhage. It was also evaluated the functional and cognitive outcome by using NIHSS, Barthel Index, and MMSE, MoCA-Ina (Montreal Cognitive Assessment Indonesia).

Conclusion: This study was very useful for Indonesia and our specialty to make some national plans to educate people to prevent stroke and recurrence especially to control the risk factors. Increase our skill in managing stroke patients, so the mortality can be reduced.

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LIFE-STYLE ASSOCIATED RISK FACTORS OF AMYOTROPHIC LATERAL SCLEROSIS – FIRST RESULTS FROM A CASE-CONTROL STUDY CONDUCTED IN THE ALS REGISTER SWABIA

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Background: The amyotrophic lateral sclerosis (ALS) is a, neurodegenerative disease, which leads to rapidly progressive muscular paralysis. Prognosis is poor and the majority of patients die within three to five years, mostly as a result of respiratory failure. The etiology of ALS is still largely unknown. There is some evidence that life-style factors such as smoking, physical activity (PA) and Body Mass Index (BMI) might be associated with ALS risk. However, epidemiological data are rare yet. The aim of our study was to investigate whether life-style associated factors are associated with the risk of ALS in a case-control study implemented within the epidemiological ALS registry Swabia.

Methods: Since October 2010, all ALS-patients in the catchment area of 8.6 million inhabitants are prospectively recorded in the ALS registry Swabia. In addition, a case–control study has been implemented based on the registry. To each ALS patient, two age and sex-matched controls are randomly sampled from the registration office according to residency of the cases. ALS patients and controls were asked to complete an interview-based standardized questionnaire to collect data on comorbidity, sociodemographic information, life-time history of various life style factors, and current quality of life. Written consent was obtained from all participants. We included exposure data of smoking (never-, ex-, current smoker), BMI (under-, normal-, overweight/obesity) and PA according to the International Physical Activity Questionnaire within this first analysis as potential risk factors. After a bivariate analysis, we applied a conditional logistic regression analysis to estimate crude odds ratios (OR) of ALS.

Results: Until end of April 2013, 209 eligible ALS cases (58% men, 42% women, mean age at onset 67.7 (11.8) years) in the registry could be included into the case control study. The first results were based on 177 patients and 354 controls (60% men, 40% women) for whom successful matching could be performed. Total life-time PA was observed to be higher in the control group (high-active = 10.2%) than in the ALS group (2.9%). ALS patients had a lower BMI compared to the controls. We found that current smoking and overweight/obesity was not statistically significantly associated with ALS (OR 1.3; 95% confidence interval (CI) 0.7–2.6) as well as overweight/obesity (OR 0.8; 95% CI 0.6–1.2).

Conclusion: Our preliminary results showed descriptive differences among anthropometric and life-style factors among ALS cases and controls. Some of the differences such as a lower BMI could already be a result of the disease itself. It will be further investigated whether life-time PA at different stages of life (long before ALS may have already influenced PA) is higher in controls than in patients and remains a risk factor after adjustment for covariates.

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INCREASE IN THE FREQUENCY OF BRAIN METASTASES IN PEDIATRIC CANCER PATIENTS: FACT OR FALLACY?

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Background: Most published papers on brain metastases in pediatric cancer patients point to an increase in the frequency of this rare condition. The increase is linked to advances in primary tumor treatment and the associated prolonged survival. We reviewed the records of pediatric patients with a solid primary cancer and a premortem diagnosis of brain metastasis at a large referral cancer center and evaluated the trends and patterns of occurrence of brain metastasis, among other factors.

Methods: Patients with brain metastases whose primary cancer was diagnosed during childhood were identified in the 1990–2012 Tumor Registry at The University of Texas M.D. Anderson Cancer Center. Demographic data, history and clinical data including primary cancer sites, number and location of brain and other metastases, treatments and outcomes were obtained from a retrospective review of patient hospital records.

Results: We identified 54 pediatric patients with a brain metastasis from a solid primary, a frequency of 1.4%. Sarcoma was the most common histology (54%), followed by melanoma (15%). The median ages at diagnosis of the primary cancer and the brain metastasis were 11.37 years and 15.03 years. The primary cancer was localized at the time of its diagnosis in 48% of the cases. An additional 14% had regional dissemination. The primary tumor and brain metastasis were synchronous in 15% of cases, all of whom also had other extracranial metastases. The rest of the patients were diagnosed with a brain metastasis following initiation of treatment for the primary cancer, with a median presentation time interval of 17 months from the time of diagnosis of the primary cancer (range, 2 to 77 months). At diagnosis, the brain metastasis was the first site of systemic metastasis in only 4 of 51 patients (8%) where data was available. As many as 70% of the patients had lung metastasis in conjunction with the brain metastasis. The brain metastases were single in 60% and multiple in 35%; 6% had only leptomeningeal disease. Symptoms led to the diagnosis of the brain metastasis in 65% of the cases. A plot of the yearly frequency of brain metastasis over the study period did not point to any significant increases over time.

Conclusions: To our knowledge, this is the largest single center series of pediatric patients developing a brain metastasis in the course of their disease. Our results challenge the current notion of an increased incidence of brain metastases among children with a solid primary cancer. The earlier diagnosis of the primary cancer, prior to its dissemination to distant sites (especially the brain), and initiation of presumably more effective treatments may support such an observation.

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INCIDENCE AND PREVALENCE OF EPILEPSY IN LOW-INCOME POPULATIONS: IS IT ALSO ELEVATED IN A SINGLE-PAYER SYSTEM?

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Background: Epilepsy incidence and prevalence rates are markedly higher in the Medicaid population than in the U.S. general population. The higher rates were explained in great part by the fact that the Medicaid program is representative of low-income and disabled individuals. Additionally, the multi-payer and fragmented health care system in the U.S. and barriers to adequate care may contribute to vast disparities by Medicaid status. To disentangle the effects of low incomes from that of access to care relative to disparities, we examined incidence and prevalence of epilepsy in Taiwan, by income status. Taiwan has a single-payer health care system, and nearly all of its residents have health care coverage through the National Health Insurance (NHI), regardless of their income or employment status. Thus, its data, encompassing 23 million individuals, makes it possible to examine the incidence and prevalence of epilepsy by income gradient.

Methods: We used two data sources, and limited our study population to individuals age 18–64 years. For the U.S., we used data from the 2005–2008 Medicaid Analytic Extract (MAX) files; for Taiwan, we used NHI data for the same years. To identify incident cases in 2008, we required a 3-year look-back period (2005–2007) with no claims carrying epilepsy-related diagnosis codes. To reduce the likelihood of false positives, we required the presence of at least 2 claims carrying epilepsy-related diagnosis codes, and 2 or more pharmacy claims for anti-epileptic drugs (AEDs), that were 30 days apart. Prevalent cases were those who had claims carrying epilepsy-related diagnosis codes and/or prescription claims for AEDs during the years 2005–2008. We retrieved age and sex data from both sources. In Taiwan NHI data, we identified individuals in the lowest income category if they contributed $0 to their health insurance premium. In addition to descriptive analysis, we compared the age-adjusted incidence rate between Ohio Medicaid and Taiwan, the latter across income gradients.

Results: The age-adjusted incidence rate was 301.3 and 33.0 per 100,000 PY in the Ohio Medicaid population and Taiwan, respectively. The prevalence rate was 26.4 and 4.46 per 100,000 PY, respectively. As we examined the incidence and prevalence rates in Taiwan by income gradient, we noted very little change from one level of income to the next, followed by a significant spike observed among individuals in the lowest income category. Thus, the incidence and prevalence rates in Taiwan residents in the latter income category were 178.6 (95% Confidence Interval: 161.9–197.1) and 25.7 (25.1–26.3) per 100,000 PY, respectively.

Conclusion: Despite the single-payer system in Taiwan and reduced barriers to health care services, individuals with low incomes experienced markedly higher incidence and prevalence of epilepsy than those with higher incomes. Further analysis is needed to gain a better understanding of a wide array of individual- and system-related factors contributing to income-related differentials.

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PREVALENCE OF DEMENTIA IN LEBANON: PRELIMINARY DATA FROM BEIRUT, SHOUF, AND ALEY

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Objective: In the Middle East, the current estimated dementia prevalence (6%) [1] is based on consensus judgment of an international Expert panel [2] and one study from Egypt [3]. Knowledge about risk and protective factors for dementia specific to the region is scarce, impeding the development of health promotion and disease prevention strategies. There is a high illiteracy rate among older people in the region. We have validated the 10/66 Dementia Research Group (DRG) one-phase diagnostic assessment [4] in Arabic and shown that it has excellent discriminatory ability to diagnose dementia among older people with low education (92.0% sensitivity, 95.1% specificity) Our aim is to carry out a pilot study in two governorates of Lebanon, using the validated 10/66 DRG diagnostic assessment for case ascertainment, to generate preliminary data about dementia prevalence, and assess the feasibility of a large longitudinal community-based cohort study about dementia prevalence and incidence, risk and protective factors in Lebanon.

Methods: Based on an estimated prevalence of 6% [2], a maximal error of ±1%, and 25% non-response rate, the cohort study requires 2,500 individuals older than 65 years randomly selected from all regions of Lebanon, and distributed across the 25 districts within the six governorates of Lebanon according to the proportions of people older than 65 living in each district. For this pilot study, a random sample of 521 participants from Beirut governorate and two districts of Mount Lebanon governorate (Shouf and Aley) are needed. A multi-stage cluster sampling is employed. Beirut was divided into 594 clusters containing 50 residential buildings. A random sample of 60 clusters was selected from the 594 clusters. Finally, seven clusters were randomly selected from the 60 clusters. Within the selected clusters, the field workers knock on every door to recruit participants. In Shouf and Aley districts, a number of villages or administrative sectors is randomly chosen and weighted according to their respective sizes. In the chosen villages and cities, every fourth household from a randomly chosen starting point will be selected. The field workers door knock the households and interview any person who is 65 years old and above and their caregivers. In addition to the 10/66 DRG diagnostic assessment, back ground and risk factor questionnaires will also be administered. The field workers are non-medical university graduates.

Results: Data collection started in June 2013. Forty participants have been recruited within two weeks, 80% are from Beirut and 20% from Aley. 67.5% are women and 32.5 men. 60% are in the 65–74 years old age group, 35% in the 75–84 age group, and 5% in the 85 and above age group. 27.5% have no formal education, 15% finished elementary school, 22.5% intermediate

school, 25.0% secondary school, and 10% university and above. A dementia prevalence of 25% was found.

Conclusion: Preliminary data analysis showed a high prevalence of dementia. Data collection will be concluded in September 2013 and presented at the conference in November.

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INTRAVENOUS THROMBOLYSIS UTILIZATION AND MORTALITY AFTER ACUTE ISCHEMIC STROKE IN A POPULATION BASED US STUDY

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Objectives: The objectives were 1) determine the rate of intravenous tissue plasminogen activator (IV rt-PA) use for acute ischemic stroke (AIS) in a population-based study and 2) determine the impact of IV rt-PA on 30 day, 3 month, and 1 year mortality.

Methods: The study was conducted using the Rochester Epidemiology Project (REP) records-linkage system. The REP is a unique research infrastructure that links together nearly all of the medical records of the residents of Olmsted County, MN for approved medical research. The electronic medical records of all AIS patients (resident of Olmstead County for at least 12 months, age more than 18 years, and research authorization present) seen in the emergency department of one of the two hospitals included in the REP within 24 hours of symptom onset from January 1, 2007 to December 31, 2011 were reviewed. We identified all AIS (primary or recurrent) using discharge diagnoses (International Classification of Diseases 9th revision codes 433.x1, 434.xx, and 436). Only the first patient admission during the study period was included. We validated this cohort by cross checking it with the hospital stroke registry that was maintained prospectively since 2006 to report data for Joint Commission Accreditation. A stroke nurse obtained a list of stroke patients using discharge ICD 9 codes (433.x1, 434.xx, and 436), verified these patients with the medical record, and added the ones that were missed by the ICD 9 codes. A random sample of 59 patients with AIS (10%) was also manually reviewed by a board certified neurologist to check the accuracy of ICD 9 codes for AIS. The positive predictive value (PPV) of a combination of ICD 9 codes (433.x1, 434.xx, and 436) to identify acute ischemic strokes was 93%. Intravenous thrombolysis was identified using manual chart review. The REP linkage database was used to identify the status (living/dead) of all patients at last follow up.

Results: A total of 537 AIS patients met the study inclusion criteria. Intravenous rt-PA was used in 61 patients (11.4%). Use of IV rt-PA increased over time from 8.3% in 2007 to 11.6% in 2011. There was no statistically significant difference in age, sex, race, ethnicity, educational level, employment status, marital status, or smoking status between the IV rt-PA group and non IV rt-PA group. Patient living in an assisted living setting were more likely to receive IV rt-PA compared to those not living in an assisted living ($p = 0.05$). Post-stroke mortality was 12%, 15%, 21%, and 37% at 30 days, 3 months, 1 year, and last available follow up (mean follow up of 28 months) respectively with no significant difference between IV rt-PA and non IV rt-PA groups.

Conclusions: IV rt-PA is used for 11.4% of the acute ischemic stroke patients in Olmsted County, MN. Use of IV rt-PA has no impact on mortality up to 28 months following AIS.

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META-ANALYSES TO INVESTIGATE GENE-ENVIRONMENT INTERACTIONS IN NEUROEPIDEMIOLOGY

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Most neurological diseases are caused by multiple genetic and environmental factors. An increasing number of researchers are now studying the combined effects of genetic and environmental factors on disease by examining gene-environment interactions (GxE). Opportunities to combine studies systematically using a meta-analysis approach are therefore increasing. A GxE meta-analysis aims to resolve whether a true interaction is present, and can examine the magnitude and type of interaction that might be present. This paper describes how to examine GxE using observational study designs and how to conduct a meta-analysis of studies on GxE. Most methods and challenges related to a standard meta-analysis apply to a GxE meta-analysis. There are, however, some differences. Firstly, with GxE there is the capability of using a case-only design. The independence assumption that underlies this method might, however, not always hold. Secondly, research on GxE interactions might be more prone to publication bias because interactions are often not the primary hypothesis and only 'exciting' significant GxE findings are reported out of a range of secondary analyses. Lastly, in disease aetiology research, there has been debate whether to measure interaction on a multiplicative or additive scale. There are some significant challenges associated with measuring interaction on an additive scale and the associated uptake of the measures of additive interaction has been limited. As a result, the methods of analysing interaction have been less consistent and the reporting so far has been highly variable. We suggest to use the STROBE reporting to allow evaluation of interaction on both scales [1].

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STROKE KNOWLEDGE IN NORTHER INDIA

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Aims and Objectives: This study is presented to know about the knowledge of population of North India state, Uttar Pradesh. Questionnaire based study among 1,000 subjects is been presented.

Observations: Of them, 60% patients were from rural population and 89% were from below 45 years age group. 85% were educated above high school. None of them feel that stroke is due to supernatural power but 60% (600 patients) had knowledge that stroke is due to certain blow of fowl air. 80% don't think that stroke is due to tobacco smoking or obesity. Primarily, 6% feel that faith healer use to treat strike. 415 subjects feel that proper treatment by physician is required to stroke.

Conclusion: There is strong need for proper education for management of stroke.

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CHILDHOOD TRAUMATIC BRAIN INJURY (TBI) IN THE COMMUNITY: CHILD, CLINICAL AND ENVIRONMENTAL PREDICTORS OF COGNITIVE, BEHAVIOURAL AND QUALITY OF LIFE OUTCOMES IN A NEW ZEALAND POPULATION-BASED STUDY

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Traumatic Brain Injury (TBI) is a common cause of death and long-term disability during childhood. This paper describes injury characteristics, cognitive, behavioural and quality of life outcomes post-TBI of a NZ population-based cohort of children aged 15 year or less from the Brain Injury Outcomes New Zealand in the Community (BIONIC) study. Of the 441 children who were identified with TBI by this study over 12 months commencing March 2010, 97% sustained a mild TBI, with males (64%) and urban residents (73%) at increased risk. 41% of TBIs occurred at a private residence, while 63% of injuries occurred during leisure/play activities. Falls (56%) and recreational injuries (22%) were most frequent. 273 (62%) children agreed to follow-up. At baseline, 1, 6 and 12-months post-TBI each child completed an age-appropriate assessment of general cognitive function (Woodcock Johnson-III Tests of Cognitive Achievement for children aged 2 to 7 years or the CNS-Vital Signs for children aged 8 to 15 years at the time of injury). Additionally, at each time point parents/caregivers completed measures assessing child quality of life (Pediatric Quality of Life (PedsQLTM) 4.0 Generic Core Scales), and maladaptive and adaptive functioning in home and community settings (Behavioural Assessment System for Children-Second Edition). Results are examined in relation to age at injury, TBI severity and developmental outcomes. Predictors of outcomes were examined, including measures of pre-injury health and behaviour, as well as a range of clinical factors and post-injury socio-familial measures. The role of general cognitive function was also examined in terms of contributions to post-injury behaviour and quality of life outcomes. Findings will be relevant to clinicians, rehabilitation specialists, traumatic brain injury researchers and policy makers involved in facilitating the recovery of children and adolescents following TBI.

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PREVALENCE OF DEMENTIA IN TWO COUNTRIES OF CENTRAL AFRICA: COMPARISON OF RURAL AND URBAN AREAS IN THE EPIDEMCA STUDY

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Background: The number of estimates of dementia prevalence in low-income countries has increased during the last years, but few concerned Africa compared to Asia or Latin America continents. The aim of this survey was to compare urban and rural prevalence of dementia in two Sub-Saharan African countries.

Methods: A multicenter population-based study was carried out in Central African Republic (CAR) and Republic of Congo between 2011 and 2012 including both urban and rural sites in each country. Participants aged 65 years old and over were interviewed using the Community Screening Interview for Dementia (CSI-D), the GMS-AGECAT and the CERAD's 10 word list. Elderly with low performance to the CSI-D (<24.5/30) were then clinically assessed by neurologist and underwent further psychometrical tests.

DSM-IV and NINCDS-ADRDA criteria were required for dementia and Alzheimer's disease diagnoses; Mild Cognitive Impairment was diagnosed according to Petersen's criteria. 10/66 dementia algorithm was also used in order to compare the prevalence using both DSM-IV and 10/66 dementia diagnosis.

Results: Overall, 2,002 elderly were interviewed in both countries, including 473 in Nola (rural CAR), 500 in Bangui (urban CAR), 529 in Gamboma (rural Congo) and 500 in Brazzaville (urban Congo). Among them, respectively 182, 161, 284 and 148 had to be examined by a neurologist at the second stage, in order to establish MCI or DSM-IV dementia diagnosis. First results showed a crude DSM-IV dementia prevalence at 8.46% (CI 95% [6.11–11.33]) in Nola and at 6.40% (CI 95% [4.42–8.91]) in Bangui. Whereas in Congo, crude DSM-IV dementia prevalences were estimated at 5.67% (CI 95% [3.85–8.00]) in Gamboma and 6.60% (CI 95% [4.58–9.04]) in Brazzaville. Those prevalences were not different between the sites (p = 0.41) and did not show any rural/urban effect. 10/66 dementia prevalence will also be presented for each study area.

Conclusion: This first comparison of rural/urban dementia prevalence in Africa will add to the available figures from Sub-Saharan Africa and low-income countries. Results from the use of 10/66 dementia diagnosis in French-speaking African countries should be explored in depth for further studies.

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MULTIPLE SCLEROSIS, VITAMIN D AND MEAT SMOKING: A GLOBAL ECOLOGICAL STUDY

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Objectives: A significant correlation with the multiple sclerosis (MS) prevalence was earlier shown globally and in many subregions for the habit of meat smoking and additional curing with nitrate/nitrite for preservation. However, data were not adjusted for age and e.g. climate that might act as confounders. Furthermore the evaluation was based on an own extended literature search on meat smoking (Lauer 2012, 2013). In the present study, a more rigid adjustment was made, and published data from experts in meat processing were alternatively tested. Data on vitamin D levels were included, and both bivariate and multivariate testings were applied.

Methods: The MS prevalence in 95 countries 1980–2005 was taken from Pugliatti and Rosati (2008) and a few additional papers. Vitamin D levels in adults and children/adolescents originated from the review by Wahl et al. 2012. The habit of meat smoking for preservation was evaluated from three sources: (a) the dictionary and guide from Cambell-Platt (1987); (b) the extended work of Toldrá (2007); and (c) an own evaluation of multiple literary sources. The proportion of those >age 65 in the population and climatic variables of the respective capitals were povided by von Baratta (1999) and Landsberg (1968–1981), respectively. Bivariate correlations were assessed by the Spearman coefficient, and a multivariate regression analysis, after ranking, was added for variables with page 65 in the population (beta = 0.501; SE = 0.104; p = 0.00004) remained significant; both Toldrá's data and the own evaluation of meat smoking gave similar patterns (data not shown).

Conclusions: There was a high correlation of the global MS prevalence with the habit of meat smoking which was independent of age and some climatic variables. In contrast, vitamin D levels in serum, or plasma, were unrelated to the MS prevalence.

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PROGNOSTIC FACTORS OF EARLY DEATH ON PRIMARY INTRACEREBRAL HEMORRHAGE THE DISTRICT GENERAL HOSPITAL OF R. SYAMSUDIN SH (DGH-RS) KOTA SUKABUMI, 2005–2006

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Background: Stroke is still known as the third leading cause of death after coronary heart disease and cancer. Death due to intra-cerebral hemorrhage in the first 7 days is having high rate. Many factors are able to influence the incidence, although it can be intervene through special cure.

Objectives: To find out prognostic factors on early death due to intra-cerebral hemorrhage at the District General Hospital of R. Syamsudin SH (DGH-RS) at Kota Sukabumi.

Technique: Respondents involved in the study are stroke patients that suffer with intra-cerebral hemorrhage. The patients are being treatment at the DGH-RS and have fulfilled the inclusion of the study, from 1st January 2005 until 30th June 2006.

Method: The study is a propective cohort study and is analyzed by using survival analysis.

Result: Of 117 patients with intra-cerebral hemorrhage, an early death has ocurred at 26, 5%. The most influence variables, as prognostic factors to early death of intra-cerebral hemorrhage, are consciousness disorders HR =4.31 Confidence Interval (2.0–9.19) p = 0.000, blood depletion volume HR = 5.3 Confidence Interval (2.34–11.9) p = 0.000, and blood sugar level HR = 2.15 Confidence Interval (0.99–4.65) p = 0.051.

Conclusion: The rate of death as a result of intra-cerebral is still high, 1.e. 26.5%. There is an urgent need on controlling those factors affected the incidence of early death namely consciousness disorders, blood sugar depletion volume, in order to decrease the death rate.

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EVALUATION OF MEDICAL AND EDUCATIONAL SERVICES DELIVERED TO PATIENTS WITH IDIOPATHIC EPILEPSY IN PEDIATRIC NEUROLOGY CLINIC AIN SHAMS UNIVERSITY, CAIRO – EGYPT

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This is a retrospective study which was designed to assess the quality of services delivered to patients with idiopathic epilepsy through evaluation of diagnostic procedures, regimens of therapy, epilepsy education, adequacy of seizures control and complications among children following up in the Pediatric Neurology Clinic, Ain Shams University Children's Hospital, Cairo – Egypt. The study included 230 [30%] files of patients diagnosed as idiopathic epilepsy out of 1,399 total number of epileptic patients following up in the clinic during the period from 2000 to 2011. The patients' age ranged from 0–15 years; onset of seizures was from 1–5 years

in 53.4% of cases while 82% of them exhibited generalized seizures and 17.8% focal seizures. Family history was documented in only 2.2% of cases. Regarding diagnostic tools; 97.4% had digital EEG; 94.8% had brain CT-scan patients; complete blood count, liver and kidney function initially before start of therapy. Follow-up EEG was done to 67% but only 16.2%. of cases was documented in files. In our research 76.5% were on mono-therapy, 18.7% on double therapy and 4.8% on triple therapy. The most common used drugs were Valproate and Carbamezepine; 30–50% of total patients continued 2 years seizures free period. For educational services and medical instructions, they were given to the family in 30% of cases only as an oral recommendation. No education sessions or papers were available. Patient's availability and compliance was scheduled every 2–4 weeks and the percentage of compliance was 79%. Also there was no follow-up to cognitive function, academic achievement and behavioral problems. We concluded that the poor filing system masks the quality of medical service offered to the patients. Enhancement of the system and implementation of multidisciplinary team including psychologist and social worker could lead to great improvement in the outcome of those patients.

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INCIDENCE RATE OF INTRAUTERINE GROWTH RESTRICTION AND ITS ADVERSE INFLUENCE ON FETAL-NEONATAL HEALTH: A REPORT FROM MAINLAND CHINA

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Objective: To explore the incidence and high risk of IUGR and the damage to fetal-newborn caused by IUGR, providing a theoretical evidence for the clinical prevention and treatment.

Methods: The incidence and high risk of IUGR. From Jan 1,2011 to Dec 31, 2011, the clinic datum of maternal and newborn in six domestic hospitals were retrospective analysed, excluding those neonatus who were at <28 w of gestational age and those cases which badly lack clinical data. 1000 SGA were investigated and 1000 cases were selected by birth weight of 10% to 90% of its spaces appropriate for AGA using stratified random sampling method and taken as control group. The damage to fetal-newborn caused by IUGR. From Jan 1, 2011 to Dec 31, 2011, among the neonatus (except those who were at <28 week of gestational age and >28-day-old when admitted in the hospital and those cases which badly lack clinical data) hospitalized in department of neonatology & NICU of bayi children's hospital of Beijing, there were 679SGA, 679 AGA were chosen as control group by using stratified random sampling method.

Result: (1) 35418 neonatus chosen from the six hospitals were enrolled into this study. 3106 neonatus were SGA, the incidence of SGA was 8.77%. The SGA incidence of females (9.80%) was significantly higher than that of males (7.84%) ($x^2 = 6.285$, $P < 0.05$; the SGA incidence of preterm infants (16.43%) was higher than that of term infants (7.87%) and the difference was statistically significant ($x^2 = 235.5$, $P < 0.01$). Logistic analysis showed that hypertensive, abnormal amniotic fluid, and abnormality of umbilical cord were independent factors for SGA children. (3) The complication incidence of SGA including hypoglycemia, asphyxia, hypoxic ischemic encephalopathy, gastrointestinal bleeding, congenital malformation, polycythemia vera, pneumorrhagia, apnea, congenital heart disease, and disseminated intravascular coagulation was obviously higher than that of AGA, hospital stays and hospitalization cost of SGA was much higher than that of AGA.

Conclusion: The mortality of IUGR was high in China. IUGR has significantly adverse influence on fetal-neonatal health. Our research provides a certain reference value for maternal and newborn and perinatal health care. This work was supported by National Natural Science Foundation of China (81170577).

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SLEEP DISTURBANCES IN PARAPLEGICS WITHIN A LARGE URBAN COMMUNITY: PREVALENCE AND ASSOCIATED CO-MORBIDITIES

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Objective: The incidence of sleep disturbances (SD) and their impact on quality of life (QOL) are well established in able-body individuals. SD are implicated in multiple chronic conditions such as metabolic syndrome, hypertension and chronic fatigue. Fewer studies have focused on SD in spinal cord injury (SCI). We have previously reported high prevalence of sleep apnea in adolescents with SCI. The goal of this current study was to assess the frequency, characteristics and co-morbidities in paraplegic adults presenting for usual care to our specialized SCI clinic drawing from a community of urban population.

Methods: A cross-sectional descriptive study of self-reported quality of sleep in individuals with paraplegia. One hundred seventy-five consecutive wheelchair-bound paraplegics filled-up the Toronto Sleep Assessment Questionnaire© describing the quality of their sleep during the month preceding the study period. We also collected data regarding different co-morbidities and associated risk factors.

Results: Clinical characteristics and detailed SD description are shown in table 1 (age in years; all other numbers in %). Table 1 Age: range, median 18–71, 45 Gender (male/female) 84.5/15.5 Lives at home/SNF/other 94/2/4 Chronic pain 84 Muscle spasm 77 Pressure ulcers 42 Obesity (BMI >29.9) 23 Hypertension 25 Diabetes 16 Depression 36 Cigarette smoking 37 Difficulty falling asleep 80 Snoring 56.5 Repeated awakening from sleep 88 Wakening up with pain 80 Wakening up tired 81.7.

Conclusion: Sleep disturbances are very common among SCI individuals living in our urban city and they are frequently associated with multiple co-morbidities. There is an urgent need to address this issue to improve QOL and decrease the related morbid conditions.

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SLEEP APONEA (APNOEA) EPIDEMYOLOGY DIAGNOSIS AND MANAGEMENT

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The estimated OSA prevalence has been 2% for women and 4% for men Majority are undiagnosed and remain untreated Sleep Apnoea affects: 80% of difficult – to control high blood pressure patients 50% of diabetic patients 77% of morbidly obese patients Aging: Prevalence increases 2–3 times in older persons (>65 y) compared with individuals aged 30–64 years, Sex distribution for OSA: The male-to-female ratio in community-based studies is 2–3:1 Prevalence of OSA by race or ethnicity: African American individuals appear to be more predisposed to SDB than white persons OSAS is under-recognized by most primary care physicians in the United States; an estimated 80% of Americans with OSAS are not diagnosed. Undiagnosed obstructive sleep apnea, with or without symptoms, is independently associated with increased likelihood of: – hypertension, – cardiovascular disease, – stroke, – daytime sleepiness, – motor vehicle accidents, – diminished quality of life and sexual disturbance.

Session O4: Treatment/Management

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PEDUNCULOPONTINE NUCLEUS STIMULATION IN INTRACTABLE EPILEPSY: A NOVEL ADJUNCTIVE THERAPEUTIC APPROACH

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Intractable epilepsy (IE) constitutes approximately 30% of newly diagnosed cases of epilepsy worldwide but its pathogenesis and management remain a challenge to neuroscientists even today. Electrical stimulation techniques like vagal nerve and deep brain stimulations have assumed significant role as adjunctive therapies and gained popularity in recent decades.

This presentation postulates electrical stimulation of pedunculopontine nucleus (PPN) as an adjunctive therapy for patients with IE that is potentially capable of controlling intractable seizures and which is essentially based on the antiepileptic property of rapid eye movement (REM) sleep. The strong antiepileptic influence of REM sleep in humans is now well known with some researchers even claiming REM sleep as the most potent antiepileptic state in human wake-sleep cycle; also, seizures are rarely found to occur during REM sleep, even in intractable forms of epilepsy. REM sleep is found to be reduced in several forms of IE; as an example, in West syndrome (commonly associated with intractable seizures), not only REM fraction is reduced but even the severe EEG abnormalities in West syndrome disappear during REM sleep raising a possibility of existence of a linear relationship between reduction of REM sleep and severity/intractability of epilepsy. The REM system is controlled by acetylcholine neurons (AChN) in the PPN, the stimulation of which is found to induce and enhance REM sleep based on which the possible involvement of AChN in PPN has been suggested by researchers. Further, in autopsy examination of cases of West syndrome (WS), the total number of neurons in PPN and the number of AChN in PPN in particular have been found to be reduced with relative preservation of catecholaminergic neurons and GABAergic interneurons, suggesting a specific involvement of AChN in epileptogenesis. Adrenocorticotrphic hormone (ACTH), an effective anticonvulsant hormone in WS, is believed to decrease intractable spasms not only through hypothalamo-hypophyseal-adrenal axis but also through a direct action on the pontine tegmentum probably via REM sleep. The anticonvulsant, Lamotrigine, is also found to block alpha4beta2nAChRs-mediated currents suggesting the significance of involvement of AChN in epileptogenesis.

Therefore, in view of the strong antiepileptic influence of REM sleep, it is postulated that PPN may be electrically stimulated for inducing and enhancing the genesis of REM sleep throughout the night sleep time that is composed mainly of non-rapid eye movement (NREM) fraction during which the susceptibility to seizure generation and occurrence is known to be enhanced. Thus PPN stimulation is an attempt to replace NREM by REM fraction to a required and/or desired extent. PPN stimulation can be in a programmed manner with an additional manual mode of operation as per requirement of the patient. Involvement and functioning of PPN in locomotion has formed the basis of its therapeutic stimulation technique in controlling gait impairment in Parkinson's disease implying PPN stimulation is not a novel technique altogether.

Thus, the above evidence does seem to warrant an insightful study of the prospects of the postulated technique and the success that may ensue from its preliminary trials.

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FIRST STROKE UNIT IN AL AIN: FIVE YEARS EXPERIENCE

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Objectives: The very first Stroke Unit started its operation in 2007 at Al Ain Hospital which is apparently the only comprehensive stroke unit in UAE; our team includes neurologists, stroke nurses, rehabilitation team (physical, occupational and speech therapists) psychologist and clinical pharmacist. In addition we have interventional radiology, vascular and neurosurgery teams. We aim to elaborate our experience here so other centers can take head start from us for opening further stroke facilities in the region.

Methods: We looked at the Stroke Unit database over the last 5 years and observed patient characteristics, stroke subtypes, risk factors and outcomes.

Results: We admitted 1480 patients, of various ethnic origins until end of 2012. There were 387 (26%) Emirati/Omani, 327 (22.1%) Arabs, 732 (49%) of Asian origin and other nationalities 34 (2%) patients. There was a male predominance 78% (n = 1149) versus 22% (n = 331) females. In our database the young age patients were more in contrary to other stroke registries; 42% (n = 625) were 25 points. Available stroke risk factors data from January 2010 to December 2012 showed 57% (n = 486) had hypertension, 38% diabetes mellitus, 19% smoking, 19% hyperlipidemia and 16% with cardiac diseases. A total of 68 patients (8 females) presented as hyperacute stroke within the therapeutic window and were given intravenous thrombolysis, mean NIHSS score was 12. Favorable outcome on discharge mRS of 0–2 was achieved in 40 (59%), 19 (28%) patients were dependent on discharge with mRS: 3–5, and 9 (13%) had mRS of 6. The cause of death was malignant middle cerebral artery infarction and complete basilar artery occlusion. Only 3 patients had symptomatic intracerebral hemorrhage as complication of thrombolytic therapy none of which led to death. The average door to needle time was 81 minutes, while the target time was 60 minutes, though 22 (32%) patients presented on weekends.

Conclusion: We report that stroke unit is essential for every hospital in this region so a dedicated team can look after these patients and improve morbidity and mortality. In our cohort hypertension was the most common risk factor. Outcome in majority of our patients was excellent. Intravenous thrombolytic therapy was successfully implemented and currently we are striving towards developing intra-arterial and mechanical thrombolytic therapies.

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ETHICAL CONSIDERATIONS IN NEUROLOGIC AND NEURO-ONCOLOGIC RESEARCH

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Severe neurologic and neuro-oncologic diseases pose unique challenges to epidemiologic and clinical research. This presentation will focus on ethical considerations and issues that distinguish this unique patient group. As with all research, the three fundamental ethical principles outlined by the Belmont Report (a) in 1979 are: respect for persons (Recognizing the personal dignity and autonomy of individuals and ensuring special protection for persons with diminished autonomy); beneficence (maximizing the benefits of the entity under investigation while minimizing the risks to study subjects); and justice (ensuring that the benefits and risks of research are shared fairly among different types of individuals).

Whereas those same general ethical considerations apply to patients with severe neurologic and neuro-oncologic diseases, these patients often fit under the classification of a vulnerable population, and therefore pose unique challenges to research endeavors. Indeed, they are often very seriously ill individuals, dealing with major emotional and psychological issues and with the potential for diminished cognitive and functional abilities, not to mention the threat of an impending death in many. These conditions introduce several layers of complexity with regard to participation in research. Among those are (b): (1) Full disclosure of the diagnosis and the risks/benefits of the proposed research, or lack thereof; (2) achievement of a truly informed consent given the patients' typical psychological state of mind and/or neurocognitive impairments; (3) voluntariness/recognition of the patients' autonomy and right to choose their own care, where feasible, including putting quality of life ahead of survival duration, and palliation ahead of cure (Specifically with regard to voluntariness, for example, the perception that there are no other option or no better option than the research option, even if still experimental, often contributes to coercion to participate or continue participation in research, as does the dismissal of the right of patients to opt out of treatment); (4) justice, as in affording patients the opportunity for a given treatment despite the looming threat of irreversible disability and/or death. These four elements are much harder to address with these severely-ill patient groups.

In addition, the burden of research on patients and their caregivers, including but not limited to the requirements to undergo strict tests or procedures or drug washout periods that may be detrimental and make the end-of-life journey a harder one for individuals with rapidly fatal diseases, the potential additional risks, and issues of privacy and confidentiality, may be heavier in this group.

The research process carries huge responsibility and accountability. The rights and safety of participants are not to be taken lightly, especially in vulnerable populations such as patients with severe neurologic or neuro-oncologic diseases.

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ALZHEIMER'S DEMENTIA: A PROSPECT OF EARLIER DIAGNOSIS AND TREATMENT

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Alzheimer's Dementia: A Prospect of Earlier Diagnosis and Treatment As longevity increases, diseases of aging become more prominent. Dementia is a primary concern for many elderly individuals. Alzheimer's disease remains by far the most common cause of dementia of aging, increasing dramatically in the 70s and beyond. Individuals with Alzheimer's disease presumably undergo gradual progression of the pathological process, which

begins with normal aging and evolves to clinically probably Alzheimer's disease and ultimately to neuropathologically proven Alzheimer's disease. Mild cognitive impairment is a well established transitional entity with published diagnostic guidelines. Much is now known about the clinical and behavioral symptoms of Alzheimer's disease, increasing diagnostic accuracy. An early and accurate diagnosis of Alzheimer's disease is important for patients and families for future planning when the patient is still able to contribute to the decision-making, and to initiate therapy when overall function may be relatively good. A variable rate of decline has been studied at different stages of Alzheimer's disease, warranting early pharmacological therapies to tackle different neurophysiological pathways responsible for progression. Cholinergic and glutaminergic pathways alteration has evidence based disease modification therapeutic vintage. Will discuss the spectrum of dementia with respect to Alzheimer disease spectrum of diagnosis and advancement in investigation and treatment.

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VAGAL NERVE STIMULATOR EFFICACY IN THE TREATMENT OF INTRACTABLE EPILEPSY: EXPERIENCE FROM SAUDI ARABIA

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Objective: Vagus nerve stimulator (VNS) has been approved for the treatment of intractable partial epilepsy in adults and children over 12 years of age. Later on its application expanded to include younger children and other types of epilepsy. We report our experience with this treatment modality in intractable epilepsy patients in the Kingdom of Saudi Arabia.

Methods: We conducted retrospective review of 26 consecutive pharmaco-resistant epilepsy patients in whom VNS was implanted at tertiary medical center in Saudi Arabia between February 2010 and May 2013. Data collected included patient demographics, epilepsy history and characteristics, imaging findings, mean weekly seizure frequency and treatment history. Outcome measures analyzed were seizure reduction rates; anticonvulsants burden changes and effects on patients' quality of life. These data were obtained via chart reviews and/or telephone interviews with patients, families or caretakers.

Results: 26 patients were reviewed in the study. The group included 10 females (38%). Onset of seizures was from birth to 30 years (mean 5.8 ± 6.7 years). Patients' ages at VNS implantation ranged from 4 to 38 years (mean 18.9 ± 8.7 years). Average epilepsy duration before VNS is 13.2 ± 6.6 years (range 3–27 years). Epilepsy was classified as focal in 8 patients (30%), multifocal in 9 patients (35%) and generalized in another 9 patients (35%). Etiologies are brain malformation 3, bilateral cortical dysplasia 3, traumatic brain injury 3, infectious encephalitis 2, cerebral ischemia 2, brain tumor 1, metabolic disease 1, and 11 are of unknown etiology. The average number of AEDs failed before VNS is 4.2 ± 1.4. Follow up data for at least 3 months was analyzed for 18 patients. More than 50% seizure reduction was achieved in 50% of patients at 3 months, 73% of patients at 6 and 12 months and 87% of patients at 24 months. There was no significant reduction in antiepileptic medication burden during the same period. Quality of life improvement was reported in 72% of patients at 3 months, 86% at 6 months, 80% at 12 months and 75% at 24 months after VNS. One patient had revision of the device due to malfunction. No other complications were encountered.

Conclusions: Vagus nerve stimulation is a safe and effective treatment modality for pharmaco-resistant epilepsy in adult and pediatric patients. Over 50% of patients experienced more than 50% seizure reduction. In addition, greater numbers of patients reported improvement of their quality of life after VNS was implanted.

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THE PROPHYLACTIC TREATMENT OF PULSED ELECTROMAGNETIC FIELD (PEMF) IN THE REFRACTORY MIGRAINE HEADACHE, DOUBLE-BLIND, PARALLEL PLACEBO-CONTROLLED STUDY

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The aim of the study was to investigate the effect of PEMF therapy on the refractory migraine (RM). Following a two-week period of observation to determine the baseline of headache activity and fill out the MIDAS, 30 patients were randomized into placebo and active treatment group. In active group, PEMF was used for 30 minutes per session, 3 days per week lasted two weeks. The 16 patients of the active group were also exposed to added 2 weeks with a four-month follow-up. The PEMF parameters were squared electromagnetic pulses with 10 Hz frequency and 4–5 mT intensity.

The results showed a significant decrease in the headache days (frequency) ($P < 0.000$), duration of headaches ($P < 0.002$), loss work hours because of headache ($P < 0.000$) and numbers of sedative medication ($P < 0.001$) in the active to compare with placebo group after 2 week. Whiles the intensity of headache did not differ significantly (figure 1). To analyze the persistency of treatment in the active group, repeated measurement indicated significant improvement in the days and duration of headaches ($P < 0.000$) (figure 2), loss work hours ($P < 0.01$) and numbers of sedative medication ($P < 0.006$). The menstruated dependency only had interaction in the intensity of headache. Then the PEMF decreased the intensity in the non-menstrual migraine patients (figure 3). MIDAS scores was significantly decreased three months since treatment ($P < 0.000$).

PEMF (10 Hz, 4–5mT) had high beneficial prophylactic effect with good persistency in the treatment of refractory migraine. The important note is to control the appropriated dose and response of patient that should be to evaluate.

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A RANDOMIZED DOUBLE BLIND NON-INFERIORITY STUDY OF EFFICACY, SAFETY AND TOLERABILITY OF ACTORIF VERSUS REBIF IN PATIENTS WITH RELAPSING REMITTING MS

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Introduction: Beta interferon is widely used in Relapsing-Remitting MS (RRMS). Recently, the number of patients with RRMS has been increased in Iran. According to regulations of Iran ministry of health, a phase-III clinical trial should be performed prior to approval of biosimilar medications.

Methods: Patients aged 18–55 years who had RRMS according to Mc Donald's criteria 2010 and Expanded Disability Status Scale (EDSS) of 0–5.5, eligible to recieve beta interferons, were referred by neurologists and 69 patients who signed the informed consent form were included. Randomization was done through a balanced block randomization table and Blinding by labeling the medication. Each patient was visited in 2, 4, 12 & 24 weeks after the initiation of the assigned medication; flu-like symptoms, injection site adverse reactions, relapse rates, EDSS, compliance & adherence were reported during each visit;All data was analyzed by SPSS-V17. Of the included patients so far, only data of 61 patients who have been followed for ≥6 months are analysed in this report.

Results: Mean age of the patients was 32.97+8.29 years and 78.3% were females; 36 patients were receiving Actorif & 33 Rebif. Mean disease duration was 2.5+2.9 years in Actorif & 3.8+4.5 in Rebif patients; mean baseline EDSS was 1.8 in Actorif & 2.2 in Rebif patients. In the sixth-month follow-up, 12.9.8% of Actorif & 16.7% of Rebif patients reported flu-like symptoms after the injection. Of injection site reactions, erythema was observed in 93.5% of Actorif & 76.7% of Rebif patients, itching in 25.8% of Actorif & 30.0% of Rebif patients, transient ecchymosis in 22.6% of Actorif & 26.7% of Rebif patients and necrosis in none of the patients. The differences between Actorif & Rebif patients in the above adverse effects were not statistically significant ($P \geq 0.05$) except for chills that were significantly lower in Actorif patients ($P = 0.03$). Results of the laboratory tests were either similar in Actorif & Rebif patients or the difference was not significant. Six-month relapse-free rate was 83.9% (n = 26) in Actorif & 83.3% (n = 25) in Rebif patients and the difference was not significant ($P = 0.95$). In Actorif patients, mean+SD EDSS change was –0.16+0.56 scores sixth-month after initiation of the medication, it was –0.33+0.64 in Rebif patients; although the difference of baseline & sixth-month EDSS was significant within Rebif patients ($P = 0.009$), the amount of the change is less than 0.5 scores & is not clinically considerable; moreover, the decreasing trend of EDSS during this six months of follow up was not significantly different between two groups ($P = 0.27$). Drop-out rate was 11.11% (n = 4) in Actorif & 9.09% (n = 3) in Rebif patients.

Conclusion: Although the study still continues, according to the obtained results so far, Actorif seems to be similar to Rebif in safety, efficacy & tolerability.

Session O5: Neurosurgery

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ROBOTICS IN NEUROSURGICAL STEREOTACTIC INTERVENTIONS: OBLIQUE INTRAINSULAR ELECTRODES IMPLANTED OF PATIENTS WITH EPILEPSY

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Objective: This study is to investigate: The feasibility, the safety and the utility of chronic depth electrodes stereotactically implanted by a robotic arm in the insular cortex of patients suffering from drug refractory focal epilepsy.

Methods: A total number of 32 electrodes in 29 patients (in Grenoble University Hospital) were successfully implanted within the insula. 220 contacts were available for insula recording. Electrode insertion was guided by a robotic arm (Neuromate, Renishaw mayfield, Switzerland) connected to the stereotactic frame and driven by stereotactic planning software. The targetting of the insula is planned on a pre-surgical T1-MRI. The fusion between the preoperative 3D MRI and the postoperative 3D CT scan enabled us to identify the contact location in three dimensions.

Results: No morbidity occurred during the surgical step and the chronic SEEG recording or stimulation procedure. Clinical responses have been identified in terms of gyral and sulcal anatomy. They were classified into: painful responses, sensitivomotor responses, speech disturbance, oropharengeal responses, auditory phenomena and neuro-vegetative phenomena.

Conclusion: The advantages of the oblique approach are: 1. The implantation of electrodes within the insula using robotic arm appears in our study to be safe. 2. This approach can explore all insular regions by avoidance of the sylvian vascular network. 3. This approach offers a better sampling of insular EEG activity (until 10 contacts/electrode) than that obtained by the classical lateral trans opercular approach (1 ½ contacts/electrode). 4. This approach has allowed us to develop the first anatomo-functional organization scheme of the insular cortex according to its gyri and sulci.

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INTRACRANIAL EEG ICTAL ONSET FREQUENCY: HIGH OR LOW?

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Objective: To identify the predominant ictal onset frequencies with wide spectrum EEG frequency analysis.

Methods: Fourteen patients with medically refractory partial epilepsy undergoing intracranial macroelectrode monitoring (8 depth electrodes, 6 subdural grids) were analyzed. Digital EEG data was sampled at 2 kHz at various intervals. Multiband frequency and power analysis were performed to characterize the predominating frequency during the interictal, pre-ictal, ictal, and postictal periods.

Results: Fifty-one seizures – 19 seizures collected from subdural grid and 32 from depth electrodes – were analyzed. Power spectrogram of frequency band between 0–100 Hz demonstrated a significant increase of 10–30 Hz frequencies preceding the increase of 30–100 Hz frequencies by 3 seconds before propagation in 38 seizures from 10 patients. In each case, the ictal onset was localized to one to two contacts. Focal surgical resections were performed in the areas correlated to the synchronization of these alpha-beta frequencies and HFO prior to and during the patients' clinical seizures. These 10 patients have seizure-free outcomes confirming the localization. In contrast, the alpha-beta frequencies synchronization was not seen in four patients (13 seizures) who did not become seizure-free post-operatively.

Conclusion: Previous studies of HFO from intracranial EEG recordings consistently show the frequencies at ictal onset above gamma range. However, most of these studies utilize microelectrodes and/or single neuron recording techniques. In our study, HFO were preceded by lower frequency activity, and the presence of the lower frequencies synchronization correlated with post-operative seizure freedom. HFO may not be the first ictal manifestation in some cases and lower frequency ictal frequencies should not be overlooked. Larger studies are underway.

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INTRAOPERATIVE NAVIGATION IN SPINE SURGERY

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Objectives: To demonstrate the high accuracy of spinal fixation with pedicle screws insertion guided by Intraoperative 3D navigation with or without IOM.

Methods: 110 patients were operated recently over 18 months since Nov 2011 using the O-Arm Navigation (more than 80 cases with 3D fluoroscopy navigation are not included). This represent: 76 cervical lateral mass screws and 12 cervical pedicle screws more than 510 dorsal and lumbar pedicle screws, 11 patients with posterior cervical spine fixation, 6 patients with thoracic spine and 93 for lumbar spine. All these patients were operated routinely under intra operative monitoring. 3D imaging done at the positioning of the navigation clamp at the beginning of the surgery, the navigation allows real-time control on the entry point, coronal, sagittal and axial progress of the pedicle screw, and if navigating screws are used, even the progress of the screw to the final positioning is well controlled in real-time. All the patients with lumbar pedicle screws were tested at the end by pedicle screw stimulation.

Results: Marked pedicle perforation encountered in 2 patients with screw malposition which needed immediate correction. The clamp of the navigation needed to be replaced and 3D imaging was repeated in 4 patients. No neurological injury in 50 patients we performed a comparative study between IOM and the 3D O-Arm navigation, it showed the superiority of the 3D O-Arm navigation to the intraoperative pedicle screws stimulation.

Conclusion: The 3D guided spinal navigation using intraoperative imaging with O-Arm and navigation station is highly accurate, especially if the implants are navigation compatible allowing real-time control on the progress of the pedicle screws in 3 plans. It is superior to intraoperative pedicle screws stimulation alone. It helped avoiding excess use of intraoperative fluoroscopy, with less radiation to the surgical staff and to the patients and made the surgical approach much easier and quicker. With this technique, we stopped performing post-op CT scan except after 6 months if needed to evaluate the fusion.

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INTRATHECAL BACLOFEN INFUSION IN THE MANAGEMENT OF DIFFUSE SPASTICITY AND DYSTONIA-CHALLENGES IN DEVELOPING COUNTRIES

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Objectives: Richard Penn and Jeffery Kroin in 1984 were the first to report the efficacy of Intra thecal Baclofen (I.T.B) as it bypass the Blood-Brain Barrier (BBB) and provide high effective concentration at the spinal cord: site of action against spasticity. The ITB proved to be much superior to oral treatment with very low dosage (in micrograms) compared to high oral doses (in milligrams) which have their limitations and side effects such as drowsiness, seizures, psychiatric syndromes and dependence etc. Many developments happened since, with the infusion devices and the stability of the Intrathecal drugs, the refinement of the surgical techniques and the follow-up protocols. Indications: Severe diffuse spasticity and dystonia from Cerebral or Spinal Cord origin: Spastic Cerebral Palsy; Severe head injury, Multiple Sclerosis, Stroke, Brain hypoxia or others, spastic paraplegia in SCI or other spinal causes.

Materials and Methods: A total of 65 patients with severe spasticity (cerebral palsy in 21 cases 4 of them with dystonia) severe head injury in 15 cases, spinal cord injury in 9 cases, stroke in 11 cases, multiple sclerosis and other neurological

disorders in 9 cases) who had failed oral Baclofen therapy were selected. Four of patients needed intrathecal Morphine with the ITB, because of severe associated pain. Their average age was 37 years (range 6 to 91 years). Male 48 and female 17. Average duration from the initial insult to the implant was 3.4 years (range 0.3 to 10 years).

Results: Spasticity improved in all patients with positive trial. Dystonia improved in 4 patients partially. Increase of the daily dose by 10 to 30% was stabilized after 2 to 3 weeks from the procedure in most of the patients. Good outcome was achieved such as spasticity reduction (Ashworth scale improvement 2 to 3), spasm scale improvement 3 to 4 in spinal cord injury patients, quality of life and functional improvement in cerebral palsy, multiple sclerosis, spinal cord injury and in stroke patients. Pain relief in almost all cases with painful spasms. Four of patients with severe traumatic brain injury needed additional Botox injection for severe upper extremities spasticity, which was not responding sufficiently with ITB.

Complications: Complications occurred in four patients who needed surgical revision. Infection in one case, which needed implant removal, pocket seroma/hematoma in 2 cases which didn't need re-operation, CSF collection in 2 cases without need for revision. Late migration of the tip of spinal catheter into the subdural space in 2 cases. Both cases needed revision of the spinal catheter. Catheter malfunctions in one case, which was changed.

Conclusion: In carefully selected patients the ITB provides good relief of spasticity while overcoming limitations and side effects of oral Baclofen, improves residual function, prevent fixed contractures and deformities, facilitates nursing care and helps care givers, strict compliance to the follow-up appointment and treating physician's instructions are mandatory to avoid possible serious complications symptoms.

Session O6: Neurorehabilitation

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A MODEL OF GLIAL SCARRING ANALOGOUS TO ENVIRONMENT OF TRAUMATICALLY INJURED SPINAL CORD

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Objectives: To develop an in-vitro model analogous to environment of traumatically-injured spinal cord, authors evaluated change of astrogliosis following treatments of kainate and/or scratch.

Materials and Methods: Astrocyte cultures were obtained from rat spinal cords. For chemical injury (KA), the cells were treated with kainate (10, 50 or 100 uM). For mechanical injury (S), scratch were made using a plastic pipette tip by removing strip of cells; two horizontal and two vertical lines for 'moderate' and three for 'extensive' one. For combined injury (S/K), 'extensive' scratch and kainite were provided. For evaluation of neurite outgrowth, spinal cord neurons were plated onto the cultures immediately after S/K injury and some cultures were treated with kainate inhibitor.

Results: The optical immune-densities of GFAP, vimentin, CSPG, ROCK, and EphA4 were the most strongest at 50 uM kainite ($p < 0.001$) and more prominent in extensive scratch injury ($p < 0.001$). The expression of GFAP, vimentin, CSPG, and ROCK proteins in S/K were the most prominent among control, KA, S, and S/K ($p < 0.001$). The immuno-positive area fraction of GFAP and phosphacan was the biggest and that of b-III tubulin the smallest in S/K among control, S, and S/K ($p < 0.001$). The immuno-positive area fraction of b-III tubulin in kainate inhibitor-treated S/K was more increased than that in S/K ($p < 0.001$).

Conclusion: Kainate treatment following scratch induced astrogliosis and inhibiting molecules, and restricted neurite outgrowth more strongly than either one. The current in-vitro model combining scratch and kainate may be useful tools for researching the therapeutic strategy for traumatically-injured spinal cord.

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STROKE SELF-MANAGEMENT REHABILITATION TRIAL (SMART-DVD): AN INTERNATIONAL, MULTI-SITE PILOT TRIAL

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Stroke is a leading cause of death in the world and a major cause of long-term adult disability. The emotional and socioeconomic impact of stroke on patients, families, and health services is enormous. Despite improved diagnosis of stroke, even in high income countries the availability of community rehabilitation after hospital discharge, particularly outside main urban centres are limited. Even if available, support is provided for only a short period of time. Given the increasing number of stroke survivors, there is an urgent need to develop alternatives to costly face-to-face therapist rehabilitation to support stroke survivors and their families. One such highly sustainable strategy is the utilisation of new technologies, such as instructional DVDs, which can offer informative, accessible and affordable support for survivors and their family caregivers in an effort to reduce stroke burden. Observational learning is well established as one of the most effective tools for professional teaching and skill development. However, there is currently no evidence of the effectiveness of observational learning to enhance recovery post-stroke. This paper describes a current prospective, open-label, randomised, international multi-site, pilot clinical trial (~N=700). Our aims are to: 1) explore the feasibility of recruitment and likely level of support required to uptake the intervention; 2) identify the most appropriate inclusion criteria and best primary

outcome measures for conducting a full-scale randomised controlled trial (RCT); 3) inform the power calculation to assess preliminary efficacy of a DVD-based observational learning intervention in stroke survivors for improving their functional outcomes at 2 months after randomisation; and 4) determine levels of and barriers to adherence to the trial protocol for informing a full-scale RCT. Randomisation to the treatment or usual care groups is stratified by age, gender, and stroke severity (Rankin Scale). Assessments at baseline (4 weeks – 9 months post-stroke), and then 1, 2 and 3 months following randomisation will include the following: Rankin Scale (primary outcome); General Health Questionnaire-28; Daily Living Self-Efficacy Scale; and the EuroQol. At baseline, family members/informal carers will complete the Carer Strain Index and the Center for Epidemiological Studies–Depression Scale. In addition, the Bakas Caregiver Outcome Scale will be completed post-intervention. Results from the trial will be examined by age, gender, stroke severity and treatment allocation. Findings will be relevant to clinicians, rehabilitation specialists, stroke researchers and policy makers involved in maximizing the recovery of stroke survivors and reducing burden for family caregivers.

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ANALYSIS OF MENTAL TASK PERFORMANCE AND SCREENING AUTISM USING SELF-ASSESSMENT QUESTIONNAIRE

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Objectives: Autism is a communication disability caused by a problem with the brain, that typically involves delays and impairment in social skills, language, and behavior, autism generally has the repetitive action behavior and problems in social interaction. The objective of this study is screening of autism and normal Children using self-assessment tool (questionnaire) and to identify the mental performance on autism disorder subject through mental task.

Methods: Eighty Indian Children subjects (40 Normal and 40 Autism) voluntarily participated in this study and age between 3–14 years. Here we are using the Gilliam Autism Rating Scale (GARS-2) screening tool for screening autism subjects. The set of questions on communication, stereotype behavior, and social interaction was completed in school or home with the help of parents or caretakers in variety of setting to indentify the autism severity. Mental task is given through clue cards that give visual like alphabets, numbers, fruits, colours, fruits and animals to the subject. The mental task performance was calculated by finding the error of commission (failure to identified correct answer) and error of omission (failure to identified wrong answer). A statistical database is developed which will conclude the importance of the role played by GARS-2 scale and mental task.

Results: Error of commission was significantly ($P < 0.0001$) different between autism and control group. The error of commission percentage (task performance) was 75% for autism child and the percentage was 100% for control subjects. Error of omission was significantly ($P < 0.0001$) different between control and autism subjects. The percentage of error of omission (task performance) for autism was 25% and 0% for the normal children. This indicates the failure to respond to the response (correct answer) was more for autism when compared to normal group.

Conclusion: Our results show the percentage of error of commission and omission were reduced in normal subjects when compared to autism groups. This study concludes the mental task performance was low for autism children's when compared to normal children.

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DIFFERENTIAL TURNING MECHANISM CONTROLLED WHEELCHAIR FOR QUADRIPLEGIC PATIENTS USING HEAD GESTURE

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Purpose: Patients with neurological disorders such as paraplegia, Quadriplegia and Parkinson's disease lose their ability to walk. For these patients wheelchairs are designed to move according to the movement of the parts of the body which requires sophisticated computer-body interface to transduce the signals from the body, as well as different application programs for preparing the hardware to interact. This paper proposes an electrical wheelchair which takes instruction for the movement in the required direction from the gestures of the head of the user. The movement of the head in any direction procures a signal which is used directly by the motor drivers to enable the management of each wheel individually. Differential turning mechanism enables the wheelchair to take sharp turns in small area. This unique approach provides a less complex methodology for acquiring signals from the body movements because it does not imply any invasive procedure reducing the aesthetic damage to the skin.

Design/Methodology/Approach: A very realistic Head gesture control device (HGCD) is designed which can be placed on the head of the user. It consists of a dual axis accelerometer which helps the user to acquire the signals from the HGCD when the user moves his/her head in any two axes. Received signals from the HGCD are sent to a compatible microcontroller which assigns the discrete motion control commands to the individual wheels of the wheelchair. A master control switch is provided within the control of the user to turn ON/OFF the system according to his/her use. This model is robust because of the implication of highly accurate electronic sensors and efficient algorithms.

Findings: This head gesture control wheelchair can be easily used by the patients suffering from disability because of its simple and user friendly design and low cost. It is an improvement upon current invasive neurorehabilitation techniques and brain-

computer interface because of its accuracy, efficiency and simple electronic applications. This will curb the paranoia existing among the disabled people and bring them with a new energy to live their own life in full spirit. Practical implications – This paper showcases the use of a motor control device (wheelchair) in with the help of the gesture of the head using HGCD. Many applications can be realized with the use of acceleration sensors. Possibility of assisting a paralyzed limb with an exoskeleton which can be controlled by the gesture of any other parts of the body can be achieved by this method.

Originality/Value: It is an innovative, low cost and effective device which can help quadriplegic patients in completing the tasks of their daily life.

Session O7: Neuroimaging Studies

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HYPOXIA AND LESION TISSUE REPAIR IN MULTIPLE SCLEROSIS

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Objective: There is no general consensus about the pathophysiological processes that lead to lesion formation in Mltiple Sclerosis (MS). Published literature suggests that hypoxia could play an important role in the lesion formation in MS. However, there is relatively little information on the role of hypoxia in the lesion repair. The main objective of this study is to investigate the role of hypoxia in lesion repair in MS.

Methods: Forty five MS patients and twenty normal controls were included in this study. Dual echo, fluid attenuated inversion recovery (FLAIR) images, and T1-weighted images were acquired at 3 T. Cerebral blood flow (CBF) was measured using the pseudo continuous arterial spin labeling (pCASL), an MRI based noninvasive technique, both in MS patients and normal controls. MS lesions, including T2 hyperintense and T1-hypointense lesions were automatically segmented from the dual echo and FLAIR using previously validated advanced image processing techniques (1–4). Probability maps for T2-hyperintense and T1-hypointense, and Gd lesion components were generated and the spatial relationship between tissue perfusion and lesion types was determined.

Results: Three distinct CBF values, two in the white matter (WM), and one in gray matter (GM) were observed: 16.3 ± 4.89, 30.46 ± 4.92 and 69.6 ± 6.39 mL/min/100 gm, respectively. The lowest and intermediate CBFs were observed in the central and peripheral WM, respectively. GM had the highest CBF. Overall, the CBF in MS patients was lower than in normal controls in multiple brain structures. The majority of the lesions containing T1-hypointense tissue components that represent the portions of lesions with more severe tissue disruption concentrated almost exclusively in the WM regions with lower CBF. The T2-hyperintense lesions that lacked T1-hypointense components and Gd lesions were more generally distributed in both higher and lower perfused WM.

Conclusions: We observed an association between hypoperfusion and lesion distribution. The majority of the T1-hypointense lesions, a significant percentage of which reflects more intense tissue disruption/destruction and an increased propensity for persistence as chronic lesions are disproportionately present with highest probability in the most hypoperfused WM regions compared to strictly T2-hyperintense lesions. The results of these multi-modal studies strongly implicate hypoperfusion as a factor that contributes to tissue destruction and may interfere with lesion repair.

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NEUROIMAGING OF HYPERACUTE ISCHEMIC STROKE'S: POST THROMBOLYSIS

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Objectives: Hyperacute ischemic strokes are treated with IV-rtPA administered within therapeutic window. Post thrombolytic therapy CT Brain is done to see if there is no hemorrhage then further anti-thrombotic and or anti-coagulant therapy is decided depending on possible mechanism of stroke. Stroke Unit in Al Ain Hospital is the state of the art facility where we in our unique setting can get MRI Brain as the first imaging post thrombolysis. We observed neuroimaging findings on MRI Brain done within 24 hours of post IV-rtPA and figured is it reasonable to do so.

Methods: We looked at the number of patients who had IV-rtPA given within the therapeutic window, from our Stroke Unit Database. Reviewed patient demographics, clinical presentations, NIHSS (National Institute of Health Stroke Scale) and pre-thrombolysis CT Brain related to the vascular territory of stroke. All of the patients, who had MRI Brain Stroke Protocol done within 24 hours, were selected. DWI/ADC Map, FLAIR, GRE sequences along with MR Angiogram of the Circle of Willis

(MRA-COW), were reviewed. Stroke subtypes (Infarcts) were identified based on location: cortical-subcortical, deep-subcortical, and brainstem. We also looked at the mRS (modified Rankin Score) at the time of discharge.

Results: There were approximately 1,500 patients who were admitted to Stroke Unit over last 5 years, out of which 68 had IV-rtPA as they presented within the therapeutic window. As per our methodology; there were 24 patients who had MRI Brain done with 24 hours, post thrombolysis. There were 20 males and 4 females, mean (+SD) age of 54 (+14) years. Clinically, eleven patients had dense hemiplegia, 8 had hemiparesis, 3 had hemiataxia and 2 had aphasia. Mean NIHSS was (+SD) 9 (+6). Pre-thrombolysis all patient's had normal CT Brain scan related to vascular territory except one who had hyperdense MCA sign. Post-thrombolysis MRI Brain done within 24 hours showed 8 had cortical-subcortical, 12 had deep-subcortical and 4 had brainstem location on DWI/ADC and FLAIR sequences. All had normal GRE sequences except 3 who had streaks of hemorrhage seen in the deep/subcortical group (lentiform nucleus). Fifteen patients had normal MRA-COW, related to the vascular territory of stroke, 4 had MCA; M1 occlusion, 5 had MCA; M2 occlusion. Mean mRS at the time of discharge was (+SD) 1 (+1).

Conclusions: We report that MRI Brain done within 24 hours can identify the extent & location of stroke, identify subtle hemorrhages, provides information about the cerebral vasculature early on in the course of illness. In our cohort most infarcts had deep-subcortical location which is probably a telltale of re-canalized vessels, where IV-rtPA failed to open smaller vessels. Further study is needed to see whether this modality of imaging should be the standard, replacing the CT brain in future.

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THE DIGITAL BRAIN LIBRARY: ENABLING CORRELATIONS ACROSS NEUROIMAGING AND BEHAVIORAL DATA IN A MIXED NEUROLOGICAL PATIENT POPULATION

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Objective: We have created a web-based neuroimaging resource that enables concurrent evaluation of multiple factors associated with the pathopsysiology of progressive neurodegenerative disorders, including Alzheimer's Disease (AD, Parkinson Disease (PD) and Essential Tremor (ET). The goal of the digital archive, and associated visualization and analysis toolbox, is to provide a 'bird's eye' view of the patient population structure arranged according to different combinations of parameters. Sorting parameters include neuroimaging markers, quantitative histopathological data, as well as attitudinal and cognitive scores obtained from neuropsychological testing.

Methods: Each subject undergoes regular Magnetic Resonance Imaging (MRI) scans and cognitive testing. In addition, a 'lifestyle' questionnaire and biographical interview are administered in order to collect individualized medical histories and record the progression and impact of the disease. Project participants also undersign consent for the postmortem examination of their brains, offering the opportunity to validate in vivo measurements with the results of cytological analyses.

Results: The distribution of specific phenotypic scores is plotted on web-based graphs that are generated dynamically based on remote client's queries. The distribution can be anchored to age- or gender-based comparisons that are linked to region-specific morphometric values, MMSE scores and even stereological estimates of cell density or size in relevant brain structures. In addition, each 'dot' in the graph is linked to MRI and virtual slice viewers for direct inspection of imaging data sets and histological material.

Conclusions: Being able to inspect multiple parameters concurrently, in association with dynamic views of anatomy and pathology yields a comprehensive view of the pathogenetic phenomena underlying neurodegeneration and highlights crucial associations between diagnostic groups, compared to neurologically normal controls.

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DIFFUSIVITY OF THE CORTICAL SPINAL TRACT IN HUNTINGTON'S DISEASE

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Introduction: Motor impairments are a critical feature of Huntington's disease (HD) and have been demonstrated in Presymptomatic HD (PreHD) subjects. Furthermore, white matter abnormalities have been shown in presymtomatic and symptomatic HD subjects using Magnetic Resonance Imaging (MRI), and Diffusion Tensor Imaging (DTI).

Objectives: To examine the crucial white matter motor tract that connects the primary motor cortex to the spinal cord, the cortical spinal tract (CST), using DTI tractography in HD.

Methods Subjects: (25 HD, 25 PreHD, 50 healthy controls). DTI data was acquired (3T Allegra for 3 repeats), using SE echo-planar imaging (TE/TR: 89/8500 ms, bandwidth: 2126 Hz/voxel, matrix: 128 × 128, 80 axial slices, voxel size: 1.8 × 1.8 × 1.8 mm) with 30 isotropically distributed orientations for the diffusion sensitizing gradients at a b value of 1000 s/mm2 and 6 b = 0 images. DTI images were processed with FMRIB's Software Library. Tractography was done in TrackVis. Tractography was performed by manually drawing two regions of interest on each individuals fractional anisotropy color map. A general linear model was used to test for differences between groups with sex and age included as covariates. Correlations analysis was done between CAG repeat length, Disease Burden and UHDRS1 (motor assessment).

Results: Tractography results showed decreased fractional anisotropy and increased axial and radial diffusivity in the CST of HD patients. PreHD and HD, CST FA, AD, and RD were correlated with CAG repeat length and Disease burden, as well as motor (UHDRS1I) assessment.

Conclusion: We have shown using DTI tractography, that the CST is impaired in HD patients. Furthermore, the tract is correlated with motor scores; underscoring the important functional role it plays in motor impairment in HD. CAG repeat length negatively affects the connectivity of the CST, suggesting a strong genetic component for structural connectivity.

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MRI VOLUMETRY REVEALS SYMMETRY OF THE TRIGEMINAL NERVES IN THE MILD NEUROVASCULAR CONFLICT

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Objectives: Neurovascular conflict (NVC) may predispose to trigeminal neuralgia (TNI). The aim of this study was to validate a novel volumetric technique for the trigeminal nerve and to assess possible atrophy of the nerves influenced by NVC in the healthy population.

Methods: 59 subjects (31 men, 28 women, mean age 64.2 ± 15) underwent 3T-MRI. The presence of NVC was classified as none, unilateral or bilateral. The following grades were used to classify NVC: Ia (parallel NVC), Ib (crossing vessel and trigeminal nerve), or II (trigeminal nerve compression/dislocation). Trigeminal nerve (TN) MRI volumetry was performed using a novel method with thresholding in 23 subjects with unilateral NVC. In all cases the measurement was repeated twice by two operators to assess reliability.

Results: NVC was present in 37 subjects (62.7%). Bilateral NVC was observed in 23.7% (n = 14), unilateral in 39% (n = 23). Fifty-one TN (43.2%) showed NVC. Grade Ia NVC was found in 40 cases, Ib in 11, II in 0 cases. No differences in trigeminal nerve volume were observed between the NVC versus non-NVC side. The intra- and inter-rater variability was 8.5% and 10.5% respectively.

Conclusions: NVC grade Ia and Ib in the healthy population is common, but has no impact on trigeminal nerve volume, which can be reliably assessed using semi-automated MRI volumetry.

Session O9: Neuropharmacology

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A RANDOMIZED DOUBLE BLIND NON-INFERIORITY PHASE III STUDY OF EFFICACY, SAFETY AND TOLERABILITY OF ACTOVEX VERSUS AVONEX IN PATIENTS WITH RELAPSING REMITTING MS

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Introduction: Beta interferon is widely used in Relapsing-Remitting MS (RRMS). Recently, the number of patients with RRMS has been increased in Iran. According to regulations of ministry of health of Iran, a phase-III clinical trial should be performed prior to approval of biosimilar medications.

Methods: Patients aged 18–55 years who had RRMS according to Mc Donald's criteria 2010 and Expanded Disability Status Scale (EDSS) of 0–5.5, eligible to recieve beta interferons, were referred by neurologists and 56 patients who signed the informed consent form were included. Randomization was done through a balanced block randomization table and Blinding was done by labeling the medication using 2 trained nurses who had not any other role in the study. Each patient was visited in 2, 4, 12 & 24 weeks after the initiation of the assigned medication; flu-like symptoms, injection site adverse reactions, relapse rates, EDSS, compliance & adherence of the patients were charted during each visit; lab tests including CBC, liver and thyroid function tests were also performed in 1, 3 and 6-months follow-up visits; Of the included patients so far, only data of 56 patients who have been followed for more than 6 months was analyzed using SPSSV 17.

Results: Mean age of the patients was 31.95+7.61 years and 89.3% were females; 28 patients were receiving Actovex & 28 Avonex. Mean disease duration was 5.6+5.5 years in Actovex & 4.0+3.9 in Avonex patients; mean baseline EDSS was 2.5 in Actovex & 1.6 in Avonex patients. In the sixth-month follow-up, 19.2% of Actovex & 28.6% of Avonex patients reported flu-like symptoms after the injection. Of injection site reactions, erythema was observed in 11.5% of Actovex & 7.1% of Avonex patients, itching in 11.5% of Actovex & 0% of Avonex patients, transient ecchymosis in 9.4% of Actovex & 27.3% of Avonex patients and necrosis in none of the patients. The differences between Actovex & Avonex in the above adverse effects were not statistically significant (P more than 0.05) except for chills that were significantly lower in Actovex patients (P = 0.005). Results of the laboratory tests were either similar in Actovex & Avonex patients or the difference was not significant. Six-month relapse-free rate was 69.2% (n = 18) in Actovex & 82.1% (n = 23) in Avonex patients & again, the difference was not statistically significant

(P = 0.26). In Actovex patients, mean ± SD change EDSS was –0.09+0.63 six-month after initiation of the medication, it was –0.14+0.55 in Avonex patients; the difference between baseline & sixth-month EDSS was not significant in any of the groups and neither was the decreasing trend of EDSS between two groups (P = 0.75). Drop-out rate was 7.14% (n = 2) in Actovex & 0% in Avonex patients.

Conclusion: Although the study still continues, according to the obtained results so far, Actovex seems to be similar to Avonex in safety, efficacy & tolerability.

Session O10: Neuropsychology

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NEURO-PSYCHOPHARMACOGENETICS AND NEUROLOGICAL ANTECEDENTS OF POST-TRAUMATIC STRESS DISORDER: UNLOCKING THE MYSTERIES OF RESILIENCE AND VULNERABILITY

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Background and Hypothesis: Although the biological underpinnings of immediate and protracted trauma-related responses are extremely complex, 40 years of research on humans and other mammals have demonstrated that trauma (particularly trauma early in the life cycle) has long-term effects on neurochemical responses to stressful events. These effects include the magnitude of the catecholamine response and the duration and extent of the cortisol response. In addition, a number of other biological systems are involved, including meso-limbic brain structures and various neurotransmitters. An understanding of the many genetic and environmental interactions contributing to stress-related responses will provide a diagnostic and treatment map, which will illuminate the vulnerability and resilience of individuals to Posttraumatic Stress Disorder (PTSD).

Proposal and Conclusions: We propose that successful treatment of PTSD will involve preliminary genetic testing for specific polymorphisms. Early detection is especially important, because early treatment can improve outcome. When genetic testing reveals deficiencies, vulnerable individuals can be recommended for treatment with 'body friendly' pharmacologic substances and/or nutrients. Results of our research suggest the following genes should be tested: serotoninergic, dopaminergic (DRD2, DAT, DBH), glucocorticoid, GABAergic (GABRB), apolipoprotein systems (APOE2), brain-derived neurotrophic factor, Monamine B, CNR1, Myo6, CRF-1 and CRF-2 receptors, and neuropeptide Y (NPY). Treatment in part should be developed that would up-regulate the expression of these genes to bring about a feeling of well being as well as a reduction in the frequency and intensity of the symptoms of PTSD.

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PERCEPTIONS OF PSYCHOSOCIAL IMPACTS OF EPILEPSY BY AFFECTED INDIVIDUALS ATTENDING OUTPATIENT EPILEPSY CLINICS IN KADUNA STATE, NORTHERN NIGERIA

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Background: Globally persons afflicted with epilepsy suffer social and psychological problems because of a combination of inter related factors which include overprotection and seclusion from peers by parents, feeling of social isolation and stigmatization, inferiority complex and discrimination.

Aim: This study investigated some psychosocial problems faced by persons affected by epilepsy in Kaduna State, Northern Nigeria.

Design: Descriptive cross sectional study.

Patients and Methods: 242 consecutive adult subjects with at least 5 years history of epileptic seizures attending Epilepsy Outpatient Clinics of Ahmadu Bello University Teaching Hospital, Zaria and Federal Neuropsychiatry Hospital, Barnawa Kaduna, from October 2008 to April 2013. They were interviewed for historical details of personal deprivations and perceptions of social stigmatization/discriminations as a result of their illness.

Results: The subjects were 168 (69.4%) males and 74 (30.6%) females, with mean ages of 29.5 ± 12.4 and 30.7 ± 16.0 years respectively. The mean ages of first seizures were 18.6 ± 14.0 and 20.9 ± 17.4 years respectively. Their perceptions of psychosocial consequences of illness were: 219 (91%) reported remaining unhappy since diagnosis; 115 (48%) blamed illness for inability to complete school or apprenticeship; 88 (36%) claimed spouses or friends left them because of illness; 82 (34%) could not socialize for fear of stigmatization; 67 (28%) had suffered various forms of discriminations; 42 (17%) and 19 (7.8%) had attitudinal revulsions from employers and colleagues respectively; and 20 (8.2%) could not attend primary/koranic education at all because of frequent seizures.

Conclusion: Almost all subjects afflicted with epilepsy in Northern Nigeria suffer social and psychological problems.

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COGNITIVE WORKLOAD EVALUATION USING WAVELET PACKET DECOMPOSITION (WPD) OF EEG

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Objectives: Advances in technology and automation have minimized the requirement of mental functions such as information processing and decision analyses even in carrying out important tasks. There is a need to maintain an optimal level of cognitive load on the brain, especially in critical decision making fields, such as air traffic control, fire safety and military operations, where the imposed task load can be intermittently high and may lead to decreased performance or even failed task completion. A high proportion of accidents in the military scenario (about 80–85%) are reported to be due to human error resulting from failure in cognitive performance. The objective of this study is to analyse the cognitive performance and stress level of defence office employees using electroencephalographic (EEG) signal between rest and task performance condition.

Methods: Seven (7) male healthy volunteers were recruited in this study after informed consent. Each subject was evaluated in two sessions, i.e., rest – 30 minutes (sleep) and task performance – 30 minutes. The two sessions were scheduled on the same time of day, rest followed by task. In both resting and task conditions, EEG was recorded continuously from frontal (Fz, F3 and F4) and parietal (P3 and P4) scalp locations using an electronically-linked mastoids reference. After wake up from sleep, task performance session was done consisting of 30 seconds eyes closed, 30 seconds eyes open, 3 minutes recording of resting (eyes open) and three 5 minutes of mental arithmetic (addition, subtraction, multiplication and division) tasks (order counterbalanced across subjects). Between mental arithmetic task, 2 minutes feedback phase was provided. Arithmetic task was given through PSYTASK software. Slope of the relative wavelet packet energy was calculated at delta (0.4–4 Hz), theta (4–7 Hz), alpha (8–12 Hz), and low beta (13–20 Hz) and high beta (20–30 Hz) for all electrode locations.

Results: Alpha activity was significantly ($p < 0.05$) high during rest condition as compared to task performance at F3 location. In parietal lobe, low beta activity was significantly ($p < 0.05$) high during task performance when compared to rest condition. Similarly beta values were significantly ($p < 0.05$) high during task performance. When cognitive status was analysed, three subjects were very alert among whom one was fatigued. Remaining four subjects were in normal state, i.e. doesn't have any mental fatigue during task performance.

Conclusions: Our study concluded that wavelet packet decomposition of EEG showing increased beta activity and decrease in alpha activity with increase in theta activity during task performance is a good approach to assess mental fatigue and alertness level.

Session O11: Neuropsychiatry

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ASSESSMENT OF WHITE MATTER INTEGRITY USING DIFFUSION TENSOR IMAGING IN MARCHIAFAVA-BIGNAMI DISEASE WITH CORTICAL INVOLVEMENT: CASE REPORT AND REVIEW OF LITERATURE

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Marchiafava-Bignami disease (MBD) is a primary degenerative disorder of the corpus callosum (CC) which is characterized by demyelination and central layer necrosis. In rare cases MBD is accompanied by bleeding during the subacute phase. Most reported cases were chronic alcoholic and about ten percent showed cortical lesions that were associated with poor clinical outcome. We report a case of chronic alcoholic who was comatose with generalized weakness when admitted to our hospital. Magnetic resonance imaging (MRI) revealed bilateral frontoparietal cortical lesions in addition to callosal lesions typical of MBD. Nerve fiber integrity and metabolic changes were evaluated with novel MRI sequences including diffusion tensor imaging (DTI) and magnetic resonance spectroscopy (MRS). FA measured by DTI was obviously decreased in the CC, indicative of damage to the nerve fiber integrity. MRS showed increased levels of choline and creatine, as well as reduced levels of the N-acetyl-aspartate. However, the magnetic resonance perfusion weighted imaging (PWI) was unremarkable. The cortical lesions resolved after intravenous administration of high-dose multivitamins and corticosteroids. The patient regained consciousness with dysarthria and quadriplegia 3 months later. To our knowledge, this is the first case report in which DTI, together with MRS, was applied to evaluate the white matter integrity and metabolism in MBD.

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ACUTE DISSEMINATED ENCEPHALOMYELITIS WITH PERIPHERAL NERVOUS SYSTEM INVOLVEMENT. IN AN ADULT FOLLOWING MEALES

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Acute disseminated encephalomyelitis (ADEM) is an immune-mediated inflammatory disorder of the CNS usually precipitated by a viral infection or vaccination. Children are preferentially affected and post-measles is most commonly, the incidence is about 1:1000. The presenting features include an acute encephalopathy with

multifocal neurologic signs and deficits. In the absence of specific biologic markers, the diagnosis of ADEM is still based on the clinical and neuroimaging features of widespread demyelination that predominantly involves the white matter of the brain and spinal cord. ADEM is a rare disease in adults, to our knowledge, this is the first case report about adult ADEM following meales, and there was only few cases have been reported about ADEM with peripheral nervous system (PNS) involvement. Herein we report the case of a 22-year-old woman who was diagnosed ADEM with PNS injury after measles, the patient admitted to the ICU of our department due to her disturbance of consciousness, multiple cranial nerves, spinalcord and peripheral nerve extensive injury. After the administration of intravenous immunoglobulin (IVIG) and Steroid, the patient came to clinically recovery 7 weeks from symptom onset.

Session O14: Health Economics

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THE COST OF TRAUMATIC BRAIN INJURY IN NEW ZEALAND: EVIDENCE FROM A POPULATION BASED STUDY

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Background: Although the cost of treating traumatic brain injury (TBI) is substantial, few studies have summarised the cost to society of treating TBI and the burden TBI places on the health care system and families. This is in part because accurate population level data about resource use and health impact of TBI is scarce. The current study addresses these issues by combining brain injury identification from the Brain Injury Outcomes New Zealand in the Community (BIONiC) study a prospective population based incidence study of brain injuries in Hamilton and Waikato region with electronic hospital records.

Objectives: To estimate one year societal costs due to having a TBI in New Zealand in 2010 projected to 2020.

Methods: Data from a large incidence study of brain injuries (BIONiC study) were used. Details of TBI-related resource used during the first 12 months after injury were obtained for 725 new cases. An incidence-based cost of illness model was developed to estimate the average costs per case for total first year costs of TBI. Costs are measured in New Zealand dollars ($NZ) year 2010 value. Health services usage and treatment costs were estimated by combing resource utilisation data with the New Zealand Health Information Services, mortality and hospitalisation databases. The economic costs associated with TBI were projected to 2020 using population projections from the New Zealand census.

Results: The total first-year costs of all first-ever-in-a lifetime TBI that occurred in New Zealand during 2010 were estimated to be NZ$70.1 million (US$91.1 million*) with total cost for all TBIs NZ$151 million (US$196.3 million*). The average cost per case during the first 12 months was NZ$6 259 (US$8 137*) with average costs per case for mild (95% of all cases) and moderate severe TBI NZ$5 005 (US$6 507*) and NZ$31 746 (US$41 270*), respectively. The most significant categories of cost during the first year were hospitalization (NZ$21.7 million), rehabilitation (NZ$20.4 million), and the value of indirect costs was estimated to be NZ$5.8 million.

The cost of TBI is expected to increase to over NZ$ 182.8 million in 2020.

Conclusions: The cost of treating TBI varies greatly, with the majority of sufferers having only minimal costs. However, high cost TBI sufferers can incur significant costs. The economic burden for TBI is high, but substantial cost savings and improvements in outcomes may be achieved by targeting high cost individuals. Given the considerable costs associated with TBI, there is an urgent need to develop effective interventions known to prevent TBI. Further investigation of a variety of prevention strategies aimed at improving TBI, should be a priority.

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THE IMPACT OF WARFARIN AND CLINICAL FACTORS ON ACUTE HOSPITAL AND FIRST YEAR TREATMENT COSTS OF INTRACEREBRAL HAEMORRHAGE

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Objectives: Warfarin use increases morbidity and mortality in patients with intracerebral haemorrhage (ICH). We aimed to investigate the impact of warfarin and other clinical factors on acute hospital and first year treatment costs of ICH.

Methods: A retrospective study of all patients admitted to a single comprehensive stroke centre Royal Melbourne Hospital with ICH between July 2006 and December 2011. Warfarin and inpatient costs were recorded. First year costs were derived from discharge data. Univariate analyses and multivariate linear regression using a log-transformation cost model.

Results: Of 710 eligible patients, warfarin, clinical and cost data were matched for 694 (98%) with 108 (16%) warfarin-associated ICH and 586 (84%) non-warfarin associated ICH patients. Warfarin-associated ICH patients had greater morbidity ($p = 0.049$), inpatient mortality (39.8% vs 24.7%, $p < 0.001$) and tended to have greater length of stay (LOS) (10.37 vs 9.63 days, $p = 0.134$). Overall mean inpatient ($AUD 18486.9 vs 16701.9), first year ($AUD 10664.0 vs 12695.3) and combined costs ($AUD 29150.9 vs 29397.5) did not differ significantly between groups. However amongst survivors, warfarin patients had greater mean LOS (15.9 vs 11.3 days, $p < 0.001$), inpatient costs ($AUD 25979.8 vs 18330.3, $p < 0.001$) and combined costs ($AUD 43698.5 vs 35200.3, $p = 0.006$) but similar first year costs ($AUD 17718.6 vs 16869.9, $p = 0.602$). Multiple linear regressions showed LOS, complications, ICU admission and inpatient death but not warfarin to be independent factors for cost.

Conclusions: We conclude warfarin does not increase overall treatment cost, as its high mortality association appears to offset LOS, inpatient and first year costs. Survivors experience significant increase in length of stay and treatment cost in warfarin associated-ICH.

Session O15: Health

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THE VALUE OF RETROSPECTIVE STUDIES OF END-OF-LIFE CARE FOR PEOPLE WITH PRIMARY INTRACRANIAL TUMORS: INSIGHT FROM ADMINISTRATIVE DATA

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Background: One of the challenges facing practitioners managing the care and outcomes of persons with primary intracranial tumors is balancing reducing tumor burden while maintaining an acceptable quality of life even until the end of life. Prospective studies, while optimal to study this type of care, are costly and difficult to carry out. A retrospective approach is an efficient tool to monitor end of life care across jurisdictions, demographic groups and time periods. Such studies are feasible at a reasonable cost and allow the study of the whole population. Administrative health databases have the unique potential of providing population-based, unbiased, efficient measures of quality of care especially in countries where population-based data are available. The purpose of this study is to estimate, for people with primary intracranial tumors, the burden of care experienced by patients in the last six months of life.

Methods: A death-backwards cohort was assembled using historical data. Three health administrative databases maintained by the province of Quebec, Canada were used to identify the cohort and the services provided during the last 6 months of life. The hospital discharge database (MedEcho), the physician fee-for service billings databases (RAMQ), and the death registry were accessed for the years 2003–2006 inclusive, to identify persons who died from primary intracranial tumors (or its complications). An estimate of level of care-burden was created using characteristics of care during the last 6 months of life (number intensive care unit (ICU) admissions, Emergency room (ER) visits, duration of hospital stay, interventions received), we looked into the important predictors of level of care-burden and place of death in this population.

Results: 1,623 decedents were identified. 90% of people had at least one admission to an acute care hospital in the past 6 months and 23% spent ≥3 months of their last 6 months of life in acute care. In addition, 44% had ≥1 ER visits and 30% were admitted ≥1 times to ICU. Only 18% had a home visit by a physician. We found that 10% died at home, representing less than the reported average in the literature (>20%); but 49% died in hospital (acute care unite/ER/chronic care), while 40% died in a palliative care facility (palliative care or hospice). Older age group (70–79 years), high number of comorbidities, and being diagnosed with grade 4 Astrocytoma were associated with greater burden of care. Older age group (≥70 years) was associated with higher odds of dying in an unfavorable environments (e.g. ER or acute care), being diagnosed with grade 4 Astrocytoma had the opposite effect.

Conclusion: The utilization of collected clinical information available in well-structured administrative databases is accessible at a reasonable cost and allows the study of the whole population. We demonstrated, by using administrative databases, level of care-burden and place of death for people with primary intracranial tumors. More effort needs to be dedicated to facilitate accesses to palliative care services.

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DO PATIENTS WITH STROKE ENROLLED IN RESEARCH STUDIES DO BETTER?

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Objectives: Patients admitted to hospital with stroke may be approached to participate in clinical research trials. Participation in research may provide additional medical attention and monitoring of the patient while in hospital. The objectives of this study were to determine if patients with acute stroke that participate in research are more likely to receive recommended processes of care and experience better outcomes in hospital compared with patients not recruited to research studies.

Methods: Data were obtained from hospitals participating in the National Stroke Foundation (Australia) acute services audit program in 2009 (n = 86) and 2011 (n = 89). Clinicians from each hospital retrospectively audited medical records of 40+ consecutive patients using standardised procedures. Detailed information was collected on patient characteristics including stroke severity, adherence to recommended processes of care, hospital outcomes and whether or not the patient had been recruited into a research study.

Descriptive analyses were used followed by multivariable analyses. Multivariable models were adjusted for demographic and stroke severity factors, as well as processes of care, such as admission to a stroke unit, since this is known to influence patient outcome.

Models were also adjusted for patient clustering by hospital and included only those with ischaemic stroke since recommended processes of care varies according to stroke type.

Results: Of the 6,855 patients with stroke audited (2009 n = 3,307 and 2011 n = 3,548) 316 (5%) from 51 hospitals in 2009 and 53 hospitals in 2011 were found to have participated in stroke research. Patients that participated in research compared to non-participants were significantly younger (median age 74 years; IQR 64, 80 vs median age 77 years; IQR: 66, 84), were more often male (60% vs 53%) and likely to have experienced an ischaemic stroke (83% vs 76%). Those who participated in research compared to non-participants were also more likely to be admitted to a stroke unit (82% vs 53%), have a swallow screen assessment prior to oral intake (72% vs 61%), receive thrombolysis treatment (18% vs 5%)

and receive allied health assessments within 48 hours of admission for physiotherapy (70% vs 59%) and speech therapy (72% vs 61%) (all p values <0.001). There was an independent association with reduced in-hospital mortality (aOR 0.28, 95% CI 0.12, 0.67) and an increased chance of being discharged to inpatient rehabilitation (aOR 1.76, 95% CI 1.22, 2.56) if participating in research. There was no significant association for level of dependence at discharge or for being discharged to an aged care facility if participating in research.

Conclusion: We found that patients that participate in stroke research receive better care and have improved outcomes compared to those that do not participate in research when adjustments for a range of confounding factors were made. This may be due to increased monitoring associated with participation in research and greater contact with health professionals. This information may encourage patients with stroke to participate in clinical research.

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KNOWLEDGE AND ATTITUDES TOWARDS EPILEPSY IN RURAL VERSUS URBAN POPULATIONS IN ZAMBIA: A CROSS-SECTIONAL SURVEY

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Introduction: Health care of people with epilepsy (PWE) in Africa has relevant sociocultural consequences (mainly due to persistence of incorrect awareness and stigma).

Purpose: To investigate knowledge and attitudes towards epilepsy in a population sample of Zambian people, living in two urban aggregates and in the neighbouring rural areas.

Materials and Methods: We contacted a sample of people from 2 different catholic parishes situated in the south of Zambia (districts of Chirundu and Siavonga) in the summer of 2009. They interviewees were from urban and rural areas. All the participants were asked to answer to a simple questionnaire, without any exclusion. We reviewed some structured questionnaires on awareness and stigma used in neighbouring areas of Zambia and developed an ad-hoc form in English and Chitonga (the local language) to investigate knowledge and attitudes of Zambian people about seizures and epilepsy. Questions pertaining to epilepsy awareness and stigma have been scored in order to identify proper and improper answers. Proper answers were scored with a positive number (+1). Improper answers were scored with a negative number (–1). A composite score for epilepsy awareness and epilepsy stigma was then developed. Based on this score, three levels of stigma were high (<=0), medium (1–3) and low (4+).

Results: 231 unselected Zambian residents answered our survey. The median (range) age and years of education of the study sample were 32 (13–82) and 8 (0–20) respectively. There was a slight predominance of women (130, 58.6%) and a fairly homogeneous distribution of urban (107) and rural (124) residents. The level of familiarity with seizures and epilepsy was different in rural and urban settled subjects, but people who claimed had witnessed seizures were similar (86.7% and 86.9%). Almost all responders (201/216) declared having already heard about 'epilepsy' with small between group differences (p = 0.0309). The median (IQR) scores of epilepsy awareness and stigma was respectively –1 (–3;+1) and +1 (–1;+6). The univariate analysis reported age (p = 0.0097), education (p = 0.0505) and residency (p = 0.0513) as related to epilepsy awareness. In the multivariable model only education (p = 0.0131) retained significance. Sex, education and residency resulted significantly associated with the epilepsy stigma composite score, but only education and residency were significant in the multivariable model (p < 0.0001 and p = 0.0004). Rural people were mostly represented in the highest stigma level (44.2%) while urban people in the lowest (60.4%).

Discussion and Conclusions: Poor knowledge and negative attitudes towards epilepsy are still present in Zambian people, mostly reflected by poor education and living in rural areas.

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ACUTE ISCHEMIC STROKE AND SEX DIFFERENCES: A POPULATION BASED US STUDY

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Objectives: The objectives of our study were to explore sex differences in the frequency of use of IV rt-PA for acute ischemic stroke (AIS) and to assess sex differences in post-stroke mortality.

Methods: The study was conducted using the Rochester Epidemiology Project (REP) records-linkage system. The electronic medical records of all AIS patients (resident of Olmstead County for at least 12 months, age more than 18 years, and research authorization present) seen in the emergency department of one of the two hospitals included in the REP within 24 hours of symptom onset from January 1, 2007 to December 31, 2011 were reviewed. We identified all AIS (primary or recurrent) using discharge diagnoses (International Classification of Diseases 9th revision codes 433.x1, 434.xx, and 436). Only the first patient admission during the study period was included. We validated this cohort by cross checking it with the hospital stroke registry that was maintained prospectively since 2006 to report data for Joint Commission Accreditation. A random sample of 59 patients with AIS (10%) was also manually reviewed by a board certified neurologist to check the accuracy of ICD 9 codes for AIS. The positive predictive value (PPV) of a combination of ICD 9 codes (433.x1, 434.xx, and 436) to identify acute ischemic strokes was 93%. Intravenous thrombolysis was identified using manual chart review. The REP linkage database was used to identify the status (living/dead) of all patients at last follow up.

Results: A total of 537 AIS patients met the study inclusion criteria. Intravenous rt-PA was used in 61 patients (11.4%). There was no difference in percentage of men and women treated with IV rt-PA (p = 0.51). Women were older than men at the time of AIS with a 6 years difference in mean age (p = <0.0001). More men were current smokers and more women had quit smoking (p = <0.0001). More men were currently employed (p = 0.06), married (p = <0.0001), and were living in a house or apartment

(p = 0.02), whereas more women were retired, widowed, and were more often living in an assisted living facility. After adjusting for age, only marital status was statistically different between men and women. As compared to women, men were more likely to be discharged at home (p < 0.0001).

Mortality for women and men was 15% vs. 9% at 30 day (p = 0.03), 19% vs. 10% at 3 month (p = 0.008), 26% vs. 15% at 1 year (p = 0.001), 31% vs. 42% at last available follow up (p = 0.008). Mean follow up was 31 ± 21 months for men and 26 ± 22 months for women (p = 0.006). After adjusting for age, none of these differences was statistically significant.

Conclusions: Although women were older than men at the time of AIS, our study did not show any sex difference in use of IV rt-PA for AIS or in post-stroke mortality, after adjusting for the age difference.

Session O16: Ethnicity Issues

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GIPSY ORIGIN CARRIES INCREASED RISK FOR CARDIO-VASCULAR MORBIDITY AND MORTALITY IN HUNGARY

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Background: The life expectancy of the general Hungarian population drops behind that of western European and also the neighbouring central European countries' population by about 10–15 years. Gipsy ethnicity appears to have a further tragic 10 years backlog. According to the 2011 census 3.2% of the Hungarian population, about 310,000 people considers him- or herself belonging to the gipsy nationality, but there is an estimated triple factor of the real presence of this ethnic minority in the population resulting today in an about 8–900,000 members' gypsy population. Against the aging Hungarian general population, 33% of them are children and only 4% are elderly. About 60% of gipsy families have three or more children against 15% of the non-gipsy families. Their education level drops importantly behind the general population with only 4.2% of those reaching matriculation or high school graduation. 30% of them is unemployed and at least half of them lives in isolated ghetto-like, poor communities; 20% of them making their living on collecting.

Objective: We are planning to analyse the factors of the gipsy ethnicity's high morbidity and mortality for gaining chance of prevention.

Method: Considering also the multiple difficulties of a general health survey aiming to explore the detriment of this important population in Hungary, we chose a methodologically easier way, as a first step, to analyse the causative factors of their higher life expectancy. We collected the morbidity and mortality data of a big Budapest gipsy family, presenting their pedigree. We expect this family with many branches spread all over the country, being representative of the Hungarian gipsy families, although some of them have better life standards than the average roman population. In order to get hold of the data we performed personal interviews with several family members and collected the available medical letters and documents on them.

Results: There seems to be extraordinarily high cohesion and solidarity among different branches of the family living in very different – musical, business-person or unemployed – living status with 3–8 children. There is high multi-morbid risk including infant mortality and severe epilepsy and diabetes; especially the cardio-vascular diseases of young and relatively young family members, are over-represented compared to general population. Bad obesity, unhealthy, fat and carbohydrate-dominant nutrition in the wealthy family-branch, near starvation in others is typical together with smoking from childhood or young age: despite being carriers of multiple coronary and cerebro-vascular diseases and stents, many of them carry on excessively smoking till severest handicap or death occurs. There is a strikingly high frequency of benzodiazepine use and abuse while alcohol addiction and malignancies seem to be thankfully rare.

Conclusion: Low socio-economic status and education level; smoking, diabetes, obesity and young age cardio-vascular morbidity contribute to the poor mortality data of Hungarian gipsies as demonstrated by a typical gipsy family's pedigree.

Session O17: Public Health

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AWARENESS WITHIN THE TUNISIAN POPULATION CONCERNING STROKE SIGNS, SYMPTOMS, AND RISK FACTORS

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Ignorance and poor control of stroke risk factors have been considered as important factor leading to increase prevalence of stroke. We aim to assess knowledge of general population about stroke and to identify information source. We randomly selected 4000 persons living in tree countries in Tunisia (Nabeul, Kairouan and Sousse) and performed an open-ended questionnaire regarding stroke risk factors, stroke warning signs, source of information, and stroke attitude. The survey was carried out during 12 months, and administered by medical students. Only 39.4% were able to name three risk factors and 11.2% said that they do not know even a single stroke risk factor. Arterial hypertension and smoking were the most frequently risk factors cited (42.9%, 40.7%). Only 4.4% of the respondents was able to recognize three or more stroke warning sign and 45.5% don't cited any sign. The first action during a stroke attack was going to call emergency services (59.4%). Predictors of adequate knowledge of both stroke risk factors and warning signs

were female gender, urban residence and stroke family antecedents. The most common sources of information reported by persons were media (63.2%). Our study highlights the lack of knowledge of stroke signs among population of our survey. Improvements of this knowledge can only result from public media including simple and understandable information on risk factors, warning symptoms, and adequate management of stroke.

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MIGRAINE HEADACHE HERITABILITY – TWIN STUDY

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The aim of this research was to determine heritability of migraine among twin pairs.

Heritability of migraine was investigated by analyzing twins aged 3 to 21 years, on the territory of Vojvodina, Northern Province of Serbia with its population of around 3 million people and more than 20 different nationalities. By the method of random sampling 792 twins were surveyed. 396 twin pairs (42.4% monozygotic and 57.6% dizygotic).

Within the group 30.2% (239 of 792) had recurrent headaches, 21% (166 of 792) non-migraine recurrent headaches and 9.2% (73 of 792) migraine, (10.1% monozygotic and 8.3% dizygotic). The concordance for the migraine is 94.1% for monozygotic twins and 57.9% for dizygotic ones, a significant difference ($p < 0.05$). The heritability quotient for the migraine with monozygotic twins was calculated by using Holzinger`s formula and it is 0.8598. The concordance for the non-migraine was 50.0% for monozygotic and 59.3% for dizygotic twins.

The concordance for the recurrent headaches was 64.7% for monozygotic and 42.3% for dizygotic twins. Hollinger's formula was used to calculate the heritability quotient which was 0.3882. Heritability quotient of 0.3882 confirms the significance of heritability, but, at the same time, it confirms the effect of environmental factors on the appearance of recurrent headaches as well. The heritability quotient of the non-migraine headaches of 0.2286 clearly shows that the external factors are more significant than heritability when it comes to appearance of the non-migraine headaches. Migraine syndrome with heritability quotient of 0.8598 clearly shows the hereditability of the migraine.

The probability that one of the twins will not have recurrent headaches if the other one also does not have them is 0.72 for monozygotic twins, and 0.50 for dizygotic ones. If one of the twins does not have the migraine syndrome, the probability of the other one also not having them is 0.91 for monozygotic and 0.77 for dizygotic ones. The probability that the child whose twin sibling does not have the non-migraine headaches would also not have non-migraine headaches is 0.81 for monozygotic and 0.68 for dizygotic ones.

The migraine of one twin is directly dependent on the migraine syndrome of the other. This mutual dependence is different for monozygotic and dizygotic twins. The analysis of such mutual influence was calculated through the correlation (r12) and determination (r212) quotient, by method of co-variant. The very high correlation quotient of the migraine syndrome of all twins r12 0.7498; r2 12 56.12%, r12 0.8458; r2 12 1.54% of monozygotic and r12 0.6342; r2 12 40.22% of dizygotic)and the determination quotient of the migraine for all the twins 56.12% (71.54% for monozygotic, and 40.22% for dizygotic twins) show that the high degree of mutual dependence between the migraine of twin siblings, is more important with monozygotic twins.

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HOME BASED CARE OF CHRONIC NEUROLOGICALLY DISABLED IN KERALA, INDIA – A RAY OF HOPE FOR THE PHYSICIAN ABANDONED

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Introduction: Neurologic or neurosurgical illnesses were the second most common diseases in patients seen by the palliative medicine service at Cleveland clinic (Chahine et al., 2008). Domicillary physiotherapy was shown to be cost-effective as well as comparably benefificial to hospital care (Frazer et al., 1980). Similar studies in developing countries like India are rare which would become the world's most populous country in the near future.

Objectives: 1) To identify the problems of the chronic neurologically ill and their families at their residence. 2) To know whether regular home-based or hospital based follow up care is beneficial for chronic neurologically ill.

Materials and Methods: Prospective study conducted at 2 major palliative care centers (having inpatient, outpatient and house visits) in Kerala state in South India i.e. Trivandrum (south kerala) & Thrissur (central kerala) from 2007-July to 2008-Dec. All persons (both cancer & non cancer) registering in both the centers during the study period was screened for cancer related & non cancer related neurology problems and referred to the visiting neurologist. They would be visited at their residences by the palliative care team (physiotherapists, social worker, palliative care physician& community volunteers). They would identify the problems and then discuss with the neurologist, who visits their residences along with the team. The neurologist first confirms the diagnosis and treats the treatable if any. Then the patients would be planned and administered a multimodal management at home which consists of medical, physical and psychosocial rehabilitation of the patient and their family. Follow up was performed monthly by the palliative care team and reported to the neurologist and advice taken for follow up treatment and follow-up home visits would be conducted by the neurologist at appropriate times. If required they would be taken in as inpatient at the palliative care centers and treated. Appropriate scales (ADL) were applied too for quantifying the improvement.

Observation: Comparing the data received from both the centers (Trissur: 1543-total, 239 (15.5%)-purely neurological & Trivandrum: 1163-total, 184 (15.8%)-purely neurological) neurological patients accounted for 16% of the palliative care patients managed by the palliative care physicians. Stroke and

spinal cord injured accounted for majority 42% and 24% respectively. Mobility was the commonest problem observed, only 6% were advised home modifications at discharge, 76%had not seen a neurologist for at least 6 months and 95% lived in non-disabled friendly environment. 64% stroke affected persons & 22% paraplegics had improvement in ADL at 1 yr. Only 16% was admitted for inpatient care and 82% preferred home care.

Conclusion: ADL of paraplegics and stroke affected persons improve even if interventions are given at a late stage. Home based follow up care and home modifications are more ideal for the city in accessible & lower socioeconomic groups after discharge.

Reference:

Chahine et al: Palliative care needs of patients with neurologic or neurosurgical conditions. European Journal of Neurology 2008;15:1265–1272.

Frazer FW: Domiciliary physiotherapy-cost and benefit. Physiotherapy 1980;66:2–7.

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REFLECTING THE COMBINATION OF FMF AND MULTIPLE SCLEROSIS: A CASE REPORT

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31-years-old Turkish man with back and neck pain, right hemiplegia, mild ataxic gait was admitted to our inpatient clinic. In the history, he had arthritis in knee and ankle joints when he was 10 years old. This arthritic episode was than diagnosed as acute rheumatic fever. He had recurrent attacks of arthralgia, fever and abdominal pain until he was 27. Four years ago, he was diagnosed as FMF after an attack of abdominal pain, fever and arthritis of left knee and right shoulder. He was started on 1 mg of colchicine daily and symptoms subsided. The analysis of MEFV gene mutation M694V homozygote mutation had been detected before he admitted our clinic. First, the right side of two years ago, a neurology clinic with complaints of weakness and gait disturbance applied. Symptoms decreased with intravenous pulse steroid therapy. These complaints, impaired balance and difficulty walking after 1 year, 6 months ago started speech disorder. Neurological examination of the patient, right hemiplegia, mild ataxic gait, dysmetria, and positive Romberg test, there was disdiadokinezi. Routine blood and urine tests, vitamin B_{12} and folic acid levels, thyroid function tests were normal. Analysis of cerebrospinal fluid white blood cell count of 35, the protein level of 200 mg/dl, and electrophoresis was detected as positive oligoclonal bands Visual evoked potansiyel'de (VEP) and somatosensory evoked bilateral potansiyel'de conduction defects (SEP) shown to the right fibular nerve abnormalities. In 2011, the first attack the patient's cranial magnetic resonance imaging (MRI), periventricular white matter demyelinating disease, left thalamus, corpus callosum, internal capsule, pons and right cerebellar hemisphere, left ventrolateral multiple, hyperintense on T2-weighted images present in demyelinating plaques. This diagnosis is clinical and radiological findings in MS.

Session O18: Neuropharmacology

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QUALITY OF LIFE IN PEOPLE WITH EPILEPSY ON ANTI-EPILEPTIC DRUGS A HOSPITAL BASED CROSS SECTIONAL STUDY

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Objectives: The objectives of the present study were to – a) evaluate the pattern of anti-epileptic drug use and b) to examine the impact of anti-epileptic drugs therapy including other factors influencing Quality of Life (QOL) in patients with epilepsy.

Methods: This was a cross-sectional, investigator initiated study carried out in a naturalistic settings of the Neurology out-patient department at a tertiary care hospital. A random sample of patients with epilepsy, 18 years of age and above, receiving antiepileptic drugs for at least one year duration were enrolled in the study and those with serious physical or mental disabilities were excluded. Demographic, clinical and treatment parameters were collected and recorded using a structured case record form and an adapted version of Quality of Life in Epilepsy-10 (QOLIE-10) was used to evaluate quality of life among study participants. Analysis was done using SPSS version 21.

Results: A total of 200 patients enrolled for the study were with median age 26 years and predominantly males (53.5%). Maximum number of patients had partial seizures (58%) with 61% idiopathic. AED Monotherapy to polytherapy ratio was 1:1. 56% of patients received at least one new AED. The most frequently used AED monotherapy and polytherapy were Oxcarbazepine and Clobazam respectively. Maximum number of patients with partial seizures received Clobazam followed by Phenytoin and Carbamazepine. The pattern of use of AEDs among patients with generalized seizures was – Clobazam followed by Sodium Valproate and Levetiracetam. The proportion of patients who experienced an adverse drug reaction was significantly greater among those who received polytherapy than among monotherapy (75% vs 47%; $p < 0.0001$). The mean QOLIE-10 score of the patient sample was 74.58 ± 20.60. Multiple regression analysis showed increased seizure frequency ($p = 0.003$), more number of AED use ($p = 0.05$), and increased number of adverse drug reactions ($p = 0.0001$), as significant predictors of poor QOL among patients with epilepsy. However, seizure frequency, number of ADRs and overall QOLIE-10 scores did not show difference between patients who received old and new AEDs.

Conclusions: Appropriate selection, AED monotherapy and careful evaluation of their side effects were identified to play a crucial role in the present study in achieving the ultimate target of seizure freedom as well as optimal quality of life among patients with epilepsy. However, larger numbers of studies of longer duration among patients with epilepsy may be suggested to confirm the findings.

Neuro
epidemiology

Session P1: Prevention

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PATTERNS OF MULTIFOCAL ATHEROSCLEROSIS REVEALED BY DUPLEX ULTRASOUND IN CROSS-SECTIONAL POPULATION BASED STUDY

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Background: Frequency and combinations of atherosclerotic lesion in different parts of vascular bed are variable. It can be supposed that some unknown factors determine the preferential localization of the atherosclerotic lesion in different patients.

Aim: To identify patterns of the atherosclerotic lesion and their prevalence in the population of 40–59 years old people for the subsequent study of the factors associated with the higher probability of vascular events in patients with initial forms of the atherosclerosis.

Methods: Duplex sonography of carotid, vertebral, subclavian and common femoral arteries was performed in 320 subjects (114 men and 206 women, age 40–59, mean – 49 ± 5) undergoing examination in continuous cross-sectional population based study of cerebrovascular risk factors. Maximum IMT was assessed at the far vessel wall in following zones: origin of the right subclavian artery (rSCL), medium part and bifurcation of common carotid arteries (mCCA, bifCCA), proximal part of internal carotid arteries (ICA), distal part of common femoral arteries (CFA). AP were assessed in all surveyed vessels. IMT equal 0.9–1.5 mm considered pathologically increased. Findings with the thickness more than 1.5 mm were described as AP.

Results: Manifestations of the atherosclerosis at least in one of the surveyed zones were found in 96%. In 13% it was just increasing of IMT in rSCL or CFA. 34% had increased IMT in ICA, CCA or CFA without AP. AP were found in 49% of all cases. The most often zone with atherosclerotic lesion was rSCL – 89%. Men had AP in rSCL significantly more often than women (43 vs 23%, p).

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INCIDENCE OF URINARY TRACT INFECTION AMONG PATIENTS WITH ACUTE CEREBROVASCULAR ACCIDENTS: A POSSIBLE TRIGGER FOR STROKE

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Background: Acute infections and other inflammatory stimuli have emerged as important triggers of vascular events. Previous studies have reported 25 to 35% antecedent infection rates among patients with acute cerebrovascular accidents (CVA). The incidence of antecedent UTI has not been reported and could establish an important relationship between UTI and CVA.

Objective: The aim of this study was to determine and compare the incidence of antecedent UTI among CVA patients to reported UTI rates among the general population.

Methods: Retrospective review of 1295 medical records in a high volume tertiary stroke care center. Our cohort included CVA patients that also had urinalysis within 72 hours prior to or less than 24 hours after admission. Patients with bacteriuria without any of the additional findings were excluded.

Results: Thirty-seven percent (476/1295) of the patients met inclusion criteria of simultaneous CVA and urinalysis. The overall crude incidence of UTI was 39.3% (187/476). Ischemic strokes accounted for a larger percentage of patients tested for UTI (74.9%), when compared to hemorrhagic strokes (25.1%). Nonetheless, patients suffering hemorrhagic strokes had similar rates of UTI (40.2%) versus Ischemic Stroke Patients (38.7%). The incidence of UTI was significantly higher than reported infection rates of general population controls (187/476=39.3% versus 52/424=10.9%, p).

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WOMEN ISSUES IN MULTIPLE SCLEROSIS

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Multiple sclerosis gender issues Multiple sclerosis (MS) is an autoimmune inflammatory demyelinating disorder of the central nervous system. Gender influences both the susceptibility and the clinical course of MS. Substantially more women than men develop multiple sclerosis, but information about the effects of MS and gender-specific issues such as pregnancy, breastfeeding, menstruation and hormone use is lacking. A review of the available English literature around the subject is carried out to explore the

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information about gender-specific topics and the effects of disease-modifying MS therapies (DMT) including the interferons and glatiramer acetate (GA). We searched Medline and Embase (1970-to date) on all the publications on Multiple Sclerosis in women. All publications in all relevant papers were reviewed. Sex hormone was found to play a role in this gender gap. Research also suggests that a person's genes play a role in determining women susceptibility to MS. It also suggested that the rise in MS in women is triggered by an interaction between genes and environment that specifically affects women. Pregnancy is a protective period in the disease because hormonal changes seem to keep the immune system quiet. However, the risk of relapse is greatest during the first two to three months following delivery as was shown by PRIMS study. There is no identified clinical tool for predicting with certainty in advance the women with multiple sclerosis who will eventually experience a relapse in the first 3 months post-partum.

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ELECTROSENSITIVITY FROM A NEUROLOGICAL POINT OF VIEW

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Objective: The entity of electrosensitivity is still a new and a widely controversial topic in medicine. However, we cannot deny that we are increasingly confronted by patients with a variety of symptoms in the presence of cellphone transmitter masts, computers, cellphones and the like.

Method: 22 electrosensitive patients were tested and treated in a standardised way. The results were audited. Hair and urine was tested for essential elements (Mg, Se, Zn etc) and toxic heavy metals (Hg, Cd, Pb, etc.), blood was tested for genetic detoxification enzymes (Glutathion S-Transferase M1 and T1 und N-Acethyltransferase), blood was tested in the MELISA Test for hypersensitivity to heavy metals, EEG and brain mapping was performed as a baseline and in the presence of a cellphone held to the ear (but not talking), blood pressure and pulse were measured every 5 minutes with an automated blood pressure machine. Subjective symptoms were recoded in a questionnaire.

Results: There was a deficit in essential elements in 81.8% and an overload of toxic elements in 86.4% in the hair, genetic polymorphysm for GST T1 in 27.3%, GST M1 in 68.0%, GST T1 and M1 in 23% and NAT in 40.9%, hypersensitivity to heavy metals Ni59.1%, Au23.1%, Hg15.4%, Pd7.7%, Ag7.7%, Mo7.7%. There was evidence of EEG, ECG and blood pressure changes during and after exposure to electromagnetic fields induced by a mobile phone.

Conclusion: The audit provided evidence that in electro-sensitive patients there is a deficiency in essential elements and an overload in toxic elements, genetic polymorphysms and hypersensitivities against heavy metals. The EEG/brain mapping showed that the brain reacts promptly in a paradoxical way and the cardio-vascular parameter changes (heart rate and rhythm, and blood pressure) were protracted in time. The questionnaire showed that the subjective symptoms started during exposure and continued after exposure stop.

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METRICS OF VAGAL NERVE STIMULATOR SURGERY

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Objective: The purpose of this presentation is to review our experience with vagal nerve stimulator (VNS) surgery and to quantitate some key parameters.

Methods: Retrospective analysis of the clinical data on all cases of VNS surgery was done since the performance of the first operation in March of 2004. Only one surgeon was involved in this series and one device brand was used, it was manufactured by Cyberonics. The indications, types of surgeries and complications were categorized.

Results: There were 116 first time placements, 7 for depression and 111 for seizures, and 14 replacements of the entire system for a total of 130 operations on the lead and the internal pulse generator (IPG). Explantation of the IPG accounted for another 122 operations. A new IPG was implanted in 119, in 2 patients the preoperative impedance problem for which surgery was done was fixed by disconnecting the IPG from the lead and reconnecting it and the remaining patient was found to have a loose screw which when tightened solved the high impedance problem. Fourteen patients requested explantation of the whole system: in 12 patients because it was not of any benefit, in 9 of those it had been placed for seizures and in 3 for depression. In 1 patient it was not needed since resective surgery cured her epilepsy. The last patient had an infection, his VNS had been implanted elsewhere. Of the above 122 patients in whom the IPG was explanted, the lead was inadvertently cut in 1. Five patients had wound problems that required surgery: 1 skin erosion over an anchor, 1 skin thinning over an anchor, 1 suture spitting and 2 abnormal movement of the IPG causing pain. There were no postoperative wound infections in any of the above 271 surgeries. (130 VNS implants +122 IPG surgery + 14 explants + 5 wound revisions).

Conclusions: 1. Surgery to replace an IPG or fix a lead misconnection resulted in an 0.8% incidence of inadvertent lead cutting by the surgeon. 2. The infection rate was 0% in this series. 3. Over a 9 year period 8.1% (9/111) of patients in whom the VNS was placed for seizure control requested explantation due to lack of benefit as opposed to significantly more in depression where 42.8% (3/7) requested explantation due to lack of benefit. It should be noted that some of the implantations were done by other surgeons. Although those numbers should be interpreted with caution, they support the finding that VNS is significantly more beneficial for seizure control than for depression.

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IMPIGEMENT SHOULDER SYNDROME ASSOCIATED WITH PARKINSON'S DISEASE

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Subacromial impingement syndrome appear with supraspinatus tendon, subacromial bursa and bicipital tendon, humorus with coracoacromial arch in between result of crowded. Coracoacromial arch is a structre, which included coracoid proces, acromion and ligament of coracoacromial. Subacromial impingement syndrome is a common cause of shoulder pain. Etiopathogenesis of vascular, degenerative, traumatic, and blamed mechanical causes. A 48 year-old woman diagnosed with parkinsonism for 4 years was admitted to our hospital with right shoulder pain. The pain started 1 year ago, and became severe in last six months. She was feeling pain with daily activities. During the last 4 years, she was using levodopa (mg), carbidopa (mg) and entocopane (mg). At the time of admission, routine laboratory workup showed no abnormal results. Vital signs on admission were: blood pressure 120/80 mm Hg, pulse 80 beats/min, respiratory rate of 20 breaths/min, and temperature 36.4° C. The patient had bradymimi, and tremor on right hand both with action and resting. She had rigidity on righ arm. The posture of her body was normal while walking, the movement ability on her right arm was a litte lost. Apraxia was clear with both hands and obvious in right one. Because of pain in the right shoulder range of motion was limited in all directions. The impingement tests: Neer, Hawkins, painful arc and subacromial compression tests were poitif. Muscular strength, superficial sensory, motor and reflex examinations were normal. mr shoulder the acromion type 1, subacromial impingement syndrome were evaluated. The likelihood of a treatment of parkinsonism induced shoulder impigiment syndrome was raised and anticholinergic treatment was added. Fiik with tremor patients enrolled in the treatment program. (Coldpack-tens-US) created exercises Local steroid was applied to the subachromial area. The patient was discharged with no pain. Parkinon disease, dyskinesia, and tremor may develop secondary to disease or treatment. Ongoing tremor and dyskinesia paraskapular around the glenohumeral joint and muscle imbalances, paraskapular around the glenohumeral joint and muscle imbalances, characterized in rhythm changes skapulahumeral scapular dysrhyth scapula, shoulder, causing altered resting position and may play a role in the etiology of impingement.

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MICROEMBOLIC SIGNALS IN THE SYMPTOMATIC AND ASYMPTOMATIC MIDDLE CEREBRAL ARTERY STENOSIS

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Objectives: Microembolus monitoring is widely used for ischemic cerebrovascular disease with artery stenosis. There have been few reports on the clinical significance of microembolic signals (MES) in asymptomatic intracranial artery stenosis, which is more common in China. This study was designed to investigate the frequency of MES in asymptomatic middle cerebral artery (MCA) stenosis, and whether MES could be used to predict ischemic stroke in the future.

Methods: Patients who visited the ultrosound laboratory of the First Hospital of Jilin University between June 2011 to December 2012, and were diagnosed as asymptomatic and symptomatic MCA stenosis, were enrolled in the study. All of the patients who received TCD, Carotid Duplex and MES examinations were Chinese. None of the patients had ipsilateral carotid artery stenosis, potential cardiogenic emboli and blood borne emboli as well as any other artery borne embolic source. All patients had sufficient transtemporal bone windows and consented to participate in the study.

Results: A total of 209 patients who were diagnosed as asymptomatic or symptomatic MCA stenosis (83 asymptomatic patients with 108 stenosed MCA vs 126 symptomatic patients with the same number of stenosed MCA were included. By comparing the demographics and risk factors between the symptomatic and asymptomatic patients, we found the ratio of male sexuality and smoking history differed (43/83 vs 101/126, and 38/83 vs 88/126, respectively, $p < 0.01$). The frequency of MES was significantly higher in the symptomatic group than in the asymptomatic group (49/126 vs 2/108, $p < 0.01$). Specifically, the frequency of MES in the symptomatic and asymptomatic groups with mild stenosis, moderate stenosis, severe stenosis and occlusion groups were 4/18 (22.22%) vs 0/30 (0), 13/31 (41.94%) vs 1/28 (3.57%), 30/62 (48.39%) vs 1/39 (2.56%), 2/15 (13.33%) vs 0/11 (0), respectively. Except for the patients with occlusive MCA, the frequency of MES was positively correlated with the stenosis degree. Only 2 patients in the asymptomatic group were found positive for MES, and the MES number was 1 for both. During the one-year follow-up, neither of them developed ischemic stroke.

Conclusions: MES detected with TCD differed between symptomatic and asymptomatic MCA stenoses in northeast China. Due to the low frequency, the value of MES as a predictor of subsequent ischemic stroke in patients with asymptomatic MCA stenosis might be limited which may need to enlarge the sample size for further study.

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IS THERE ANY LINK BETWEEN HEAD TRAUMA AND GENERALIZED EPILEPSY DISORDER?

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Objective: Post-traumatic epilepsy (PTE) is a well known entity, results in focal onset epilepsy; Epidemiologic studies have demonstrated a clear relationship between the severity of injury and likelihood of developing epilepsy, with the risk approaching 50% in TBI cases. The hypothesis that the spike-wave discharges observed in absence; a prototype of primary generalized epilepsy (PGE), and other forms of generalized seizures are mediated through thalamic and thalamo-cortical (TC) circuits is well established since decades. However, despite abundant evidence of an important role for sub-cortical mechanisms in generalized epilepsy (GE), is also clear that the cerebral cortex plays a critical and perhaps fundamental role in the patho-physiology of these seizures. In the last decade a number of studies have challenged the concept of generalized epilepsy. There is increasing evidence that typical PGE shows focal electroencephalogram (EEG) features that cannot be explained on the basis of structural lesions. A literature search failed to disclose the similar findings of generalized epilepsy (GE) following head trauma with typical EEG findings of idiopathic generalized epilepsy (IGE). Objectives: Is there any link between head trauma and generalized epilepsy disorder? Do GE after TBI, shares some features of IGE, or is a separate entity?

Method: Patients were collected from epilepsy clinic/epilepsy monitoring unit (EMU), based on inclusion and exclusion criteria. We present a series of three patients where a strong temporal relationship between head injury and onset of generalized epilepsy observed. In this series we will discuss PTE, types of PTE, any possible association of traumatic brain injury (TBI) with IGE, and our particular patients.

Results: We found three patients, who presented with typical GTC seizures with witness account; all of them had history of head trauma with LOC and significant TBI, as evident by head CT/MRI, which confirmed the presence of brain injury. We reviewed EEGs of all patients; case one showed frequent generalized spike and wave discharges that appeared more prominent at times over right or left frontal areas. Case two had left temporal spikes followed by generalized spike and wave discharges. Case three showed symmetrical. 3–5 Hz spikes & slow waves complex, associated with polyspikes. This is already documented that EEG patterns in spike-wave discharges; though develop rapidly and may be difficult to lateralize, the spike-wave patterns are not diffuse but are predominant over the frontal cortex.

Conclusion: Our observation raised the concern that TBI can result in GE disorders, and it differs in terms of response to treatment. Based on this extensive work-up, our findings are very interesting and crucial to investigate more insight in PTE, which is very important cause of epilepsy throughout the world and especially in Saudi Arabia and Middle East.

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THE STUDY OF CEREBRAL AUTOREGULATION IN PATIENTS WITH SEVERE CAROTID ARTERY STENOSIS OR OCCLUSIONS

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Objectives: Atherosclerosis caused by severe internal carotid artery stenosis or occlusion (ICASO) is a major cause of ischemic stroke. Internal carotid artery stenosis results in a decrease in blood flow, and the main impact on the brain is low perfusion. Patients with ICASO may have various compensatory mechanisms. To our knowledge, there is no recognized gold standard of determining automatic regulation of the cerebral blood flow to pinpoint whether the cerebral blood flow autoregulation (CA) is damaged in patients with severe carotid artery stenosis or occlusion.

Methods: Subjects diagnosed as ICASO and visited the ultrosound laboratory of the First Hospital of Jilin University between January 2010 to June 2011 were enrolled. All the subjects received TCD and Carotid Duplex. Subjects with known severe arrhythmia, orthostatic hypotension or iatrogenic hypotension were excluded. The subjects with ICASO were further subdivided into symptomatic and asymptomatic groups according to whether they had a history of stroke or TIA in the past three months. We compared the CBFV differences and the duration of the x-w spike between the injured and uninjured side. Additionally, we made regular stroke recovery follow-ups and gave MRS scores to see whether supine-standing CBFV changes are related to stroke recovery.

Results: Sixty-one subjects with the same number of stenosed arteries were recruited in the study (37 males, 24 females, age range 36–88 years, average age 58 years). Additionally, there were 29 asymptomatic subjects while the symptomatic subjects were 32. CBFV of the injured side is lower than the contralateral in supine and upright position differed ($p < 0.001$). The CBFV changes from supine to upright differed between the injured and the contralateral side, and the injured side displayed greater CBFV changes than the contralateral ($p < 0.005$). By comparing the duration of the x-w spike between the injured and uninjured side, the difference is statistically significant ($p < 0.001$). Further, the supine-standing CBFV changes in the symptomatic group are larger than in the asymptomatic group ($p < 0.05$), and as well the supine-standing CBFV changes in the injured side showed a positive correlation with MRS score for the prognosis of patients.

Conclusions: CA is damaged in subjects with ICASO, and symptomatic subjects have poorer cerebral blood flow autoregulation than asymptomatic ones. And the supine-standing CBFV changes influence the prognosis of the stroke.

Session P2: Diagnosis

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CEREBRAL VENOUS SINUS THROMBOSIS, PITFALLS AND CHALLENGES

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Objectives: Continuous EEG monitoring (CEEG) is used for the classification of nonepileptic events and to evaluate surgical candidacy in patients with medically refractory partial seizure disorders. To locate the epileptic foci, the electro-encephalographer, must review all EEG data, which is complex and time consuming. The proposed method uses multiresolution analysis for the detection of interictal epileptic discharges (IEDs), in the interictal CEEG recording and the location of epileptic foci are identified among 18 channels of EEG data. Hence, classification of epilepsies is possible. When true epileptiform transients are detected in a frame, the computer saves that segment of duration of 3 seconds for further clinical evaluation. Hence documentation needs very little memory space compared to earlier detection methods. Another advantage of this method is that it determines the repetition rate of IEDs which carries a lot of information on the status of the disease.

Methods: Wavelet decomposition is carried out on each channel data using db4 wavelet and the square of detail signals at subbands 4 and 5 after thresholding are added and the sample number corresponding to the maximum of this is determined. To determine the exact location of an epileptic spike, energy of the portion of the EEG signal containing 41 spike samples is computed. The channel that reveals maximum energy corresponds to the spike location. Spiking rate or number of true spikes/minute is also calculated. The segment number corresponding to true IEDs is also noted; hence instead of storing the entire interictal EEG data, the EEG data corresponding to each segment number with IED alone is to be stored. All computations are performed separately on each channel. Results The proposed algorithm automatically identifies spikes and prunes the spike containing portion of interictal EEG and hence can be used for future reference. Results show that, Eighty four seconds out of 300 seconds of total IEEG recording are saved.

Conclusion: Real time implementation of the proposed algorithm on a fast Digital signal processor can perform on-line implementation of the automatic localization of seizure foci in 18 channels, continuous EEG recordings. One merit of the proposed method is its excellent detection performance of IEDS/minute for each channel. This leaves many opportunities for new research ideas to find out the correlation between the spikes and reported seizures.

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PROBLEMS IN THE ASSESSMENT OF DIAGNOSTIC TEST VALIDITY OF ALREADY ESTABLISHED BIOMARKERS – A SIMULATION STUDY USING THE EXAMPLE OF 14-3-3 IN SPORADIC CREUTZFELDT-JAKOB DISEASE

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Background: Whereas a definite diagnosis of neurodegenerative diseases can be obtained in post-mortem autopsies only, diagnosis during lifetime is less valid and typically based on a combination of diagnostic criteria, including cerebrospinal (CSF) biomarkers. A classic example is the use of proteins 14-3-3, which has been included in the diagnostic criteria for Creutzfeldt-Jakob disease in 1999. In recent years there has been much discussion about the diagnostic validity of 14-3-3, since the range of differential diagnoses has changed over time and since other CSF markers have become available. However, when trying to assess diagnostic accuracy of proteins 14-3-3 in Phase IIIb studies, researchers have faced two major problems: a) Studies in cases defined by lifetime diagnostic criteria might result in overestimation of diagnostic validity of 14-3-3 (since 14-3-3 is part of these criteria) b) Restriction to autopsy-confirmed cases (about 25%) might cause selection bias, since decision about initiation of post-mortem autopsy is directly dependent on 14-3-3 (since patients with consistent clinical history and 14-3-3 results are less likely to be autopsied) resulting in a underestimation of diagnostic validity of 14-3-3.

Methods: Therefore, we performed a series of simulation studies to estimate how both approaches might have biased the diagnostic validity of 14-3-3 in already performed diagnostic Phase IIIb studies using different sets of assumptions. We assumed different baseline validities of 14-3-3 (40–90% for specificity, 70–95% for sensitivity) as well as of the established lifetime diagnostic criteria (50–95% and 80–98%), investigated the effect of varying autopsy rates (15–75% overall) and the effect of differences in autopsy rates between 14-3-3 positive and 14-3-3 negative cases as well as 14-3-3 positive and negative non-cases.

Results: As the main result of our study we could show, that under extreme assumptions both approaches tend to bias point estimates of diagnostic validity in the a-priori considered way up to 30%. However, when using more realistic assumption sets, restriction to autopsy-confirmed cases is still leading to severe bias in the respective simulations (up to 30%), whereas inclusion of patients diagnosed with lifetime diagnostic criteria is overestimating diagnostic accuracy only marginally (up to 5%).

Conclusion: In the present simulation study, we address the important issue of selection bias caused by the use of a post-mortem gold standard in prospective diagnostic studies. We show that using a less valid lifetime gold standard instead of a rarely available post-mortem gold standard leads to more valid estimates of diagnostic validity in Phase 3b studies which investigate the diagnostic validity of an already established biomarker test.

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CEREBRAL VENOUS SINUS THROMBOSIS, PITFALLS AND CHALLENGES

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In the recent years, CVST have been diagnosed more frequently due to the advancement of imaging technology. CVST Patients usually present with wide spectrum of non-specific signs and symptoms. Currently, there is little information on the predictive value of certain signs and symptoms or their combination that might aid in guiding the work up of patients suspected to have CVST. In this study, the predictive value of certain clinical signs and symptoms or their combination was calculated. We analyzed all consecutive patients admitted to our emergency department who were clinically suspected to have CVST. Certain clinical signs and symptoms or their combination were evaluated regarding their diagnostic value. In total, we identified 56 patients with the initial clinical suspicion of CVST for which a vascular imaging either CT/CTV or MRI/MRV was conducted. 39 were females (71%) and 17 were males (29%). Of those 56 patients, 19 patients (34%) had positive CVST on imaging and the remaining 37 patients (65%) were negative for CVST. Risk factors were identified in 17 out of the 19 patients with CVST. The CVST patients were noted to have more frequent ER visits prior establishing the diagnosis in comparison to the negative group (9/19 vs. 1/37) with P = 0.001. In addition, 52% of the CVST patients group presented in the late spring early summer seasons. When obtained, D-dimer was positive in patients with CVST. There were no symptoms or signs specific to CVST. High index of suspicion is the key to the diagnosis. Female gender, use of OCP, pregnancy, history of thromboembolism, presence of seizure or focal deficit, recurrent ER visits for a new onset headache, and a positive D-dimer; all can be used to construct a diagnostic scale to predict the probability of CVST.

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DIABETIC POLYNEUROPATHY VERSUS DIABETIC CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY; CLINICAL, LABORATORY AND ELECTROPHYSIOLOGICAL STUDY

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Introduction: The most common type of diabetic neuropathy is symmetrical distal mainly sensory polyneuropathy, but we recognize a type of neuropathy similar to CIDP occurring in diabetics. The objective of this work is to study clinical, electrophysiological and laboratories clues to differentiate between diabetic neuropathy and CIDP like syndromes.

Patient and Methods: Patients were divided into 2 groups. Group A, include 26 patients (16 male and 10 female) with mean age 54.5 ± 7.3 had diabetic polyneuropathy. Group B, include 9 diabetic patients with CIDP like syndrome (6 male and 3 female) with mean age 58.5 ± 8.6. Motor nerve conduction study of median, ulnar, tibial and peroneal nerves, Sensory nerve conduction study of median, ulnar and sural nerves were examined. F-waves of median, ulnar, tibial and peroneal nerves were calculated. The ulnar and median conduction block were evaluated in forearm, the peroneal and tibial conduction block were evaluated in ankle to fibula neck segment. Lumber puncture was done for cerebrospinal fluid protein level.

Results: Group A showed 61.5% of patients had progressive sensory motor neuropathy while 88.8% in group B showed subacute motor neuropathy. Neurophsysiological study showed that, there was significant differences between 2 groups as regard DML, MNCV, and F-wave (P was 0.001, 0.008 and 0.001 respectively). There was no significant difference as regard unrecordable CMAP between 2 groups. Conduction block was present in 80% of patients with CIDP like neuropathy (P = 0.001). There was elevation of CSF protein in patient with CIDP like neuropathy.

Conclusion: This study showed that, there is type of neuropathy that can be developed in diabetic patients had the following characters, subacute onset, progressive weakness with electrophysiological findings of demyelination and elevation of CSF protein.

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CLINICAL AND RADIOLOGICAL PROFILE OF BASAL GANGLIA ENCEPHALITIS IN CHILDREN

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Introduction: The basal ganglia and thalamus are situated at the base of the forebrain and have wide connections to the cortex and other parts of the brain. The basal ganglia and thalamus may be involved in a variety of disease entities one of them is the CNS infection. We present this review of basal ganglia encephalitis in children reviewing the clinical presentation, radiological findings and prognosis.

Materials and Methods: All patients admitted over a three year period to our tertiary pediatric hospital with the diagnosis of encephalitis were reviewed; and those with radiological evidence of basal ganglia involvement were included in this study. Their clinical, laboratory and neuroimaging results were analyzed.

Results: Thirteen children with radiological evidence of basal ganglia involvement were studied. Cerebrospinal fluid virology PCR was positive in four; three of them had isolated basal ganglia involvement. Three patients showed basal ganglia with thalamic involvement; the remaining seven children have basal ganglia with other cerebral and brain stem involvement. Better prognosis was observed in those with combined basal ganglia and thalamic involvement.

Conclusion: Encephalitis with basal ganglia involvement is a variable clinical syndrome with specific clinical and radiological findings, thalamic involvement is associated with better prognosis unlike involvement of other cerebral or brain stem structures.

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SEIZURES WITHOUT AWARENESS: PATIENT PROFILES AND OUTCOMES

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Introduction: Epileptic seizures can occur without patient awareness invalidating historical reports of the outpatient frequency of their events. Left temporal lobe epilepsy and patients with bitemporal seizures may be at heightened risk for seizures without awareness (SWA). We sought to characterize the clinical profile of patients with SWA verified by video-EEG (vEEG) monitoring by comparing them to a group of patients with seizures with awareness (SA).

Methods: We retrospectively identified a cohort of consecutive patients with suspected SWA who were admitted to the Mayo Clinic Florida Epilepsy Monitoring Unit (EMU) for vEEG. Demographic information included age, sex, age of onset, risk factors for epilepsy, report of unawareness, MRI, EEG localization, anti-seizure drug treatment, and surgical therapyt. The cohort of patients with SWA was compared with the last case-matched patient admitted with seizure awareness (SA) who had been vEEG as part of a comprehensive pre-surgical evaluation. Group significance was measured using the Student-t test ($p \pm 0.05$).

Results: The profiles of 22 patients with SWA verified by vEEG were compared to a control group of 11 patients with SA. The mean age was 54.5 years (15 females). 64% of patients with SWA disclosed amnesia of the event in the initial consultation compared to 27% of patients with SA. Unawareness and those exhibiting awareness were validated by bedside testing while in the EMU ($p = 0.049$). 14% of patients with SWA reported at least one previous head injury compared to 36% of patients with SA ($p = 0.019$). Left temporal lobe epilepsy was the most common localization on ictal EEG. Several patients adamantly and persistently denied SWA despite a definitive diagnosis. Seizures were reported to be controlled in 59% of patients with SWA compared to 14% in patients with SA ($p = 0.047$). No difference in treatment was noted in the medical or surgical treatment arms ($p = NS$).

Conclusions: Patients with SWA possess a unique clinical profile. Those who reported SWA and those patients with closed head injuries were more likely to have SWA than those with SA. No difference in risk factors, lesional epilepsy, or treatment utilization was found though most SWA patients were likely to report seizure freedom. Left temporal lobe epilepsy was by far the most common localization for patients with SWA. Clinical history obtained by a family or friend is crucial to identifying SWA and should be required to validate historical reporting.

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A SIMPLE METHOD TO DETERMINE WHOLE BODY VIBRATION INDUCED REFLEX LATENCY

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This study describes a simple method to determine the reflex latency of low frequency (25–50 Hz) vibration stimulation applied to the neuromuscular system. The new method relies on the fact that each stimulus generates a response at the same latency. To bring out the latency of the stimulus evoked response, we used a part of the stimulus wave as the trigger and averaged the EMG responses around the trigger. We have then superimposed the averaged EMG responses that were obtained using different stimulus rates and obtained 'cumulated average' of the EMG. Cumulated average of the EMG illustrated the time point where the reflex responses were synchronized. Time of synchronous occurrence of the reflex response was taken as the reflex latency. This reflex latency was also compared with the reflex latency value obtained using the classical method of cross correlation. We found that both methods gave the same reflex latency value and hence both methods were comparable.

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REPORT OF TWO CASES WITH OCCULT CERVICAL SPINAL DYSRAPHISM AND SCOLIOSIS

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Spinal dysraphism (SD) is the partial fusion or malformation of bone and neural structures of the spine by errors in the closure of the neural tube during embryogenesis. SD commonly occurs at the thoracolumbar and lumbosacral levels, and cervical SD is an uncommon condition that comprises 1–5% of all spinal anomalies. Occult SD is generally diagnosed incidentally on plain radiography or magnetic resonance imaging. Clinically important occult SD may cause muscle weakness, cutaneous abnormality, Klippel-Feil syndrome, thoracic hemivertebra, foot deformity, sensory abnormality, urinary incontinence, gait abnormality and scoliosis. We report two adult females with occult cervical spinal dysraphism and thoracolumbar scoliosis who presented with neck and shoulder pain. Case Report 1: A 21-yr-old woman admitted to an outpatient physical therapy clinic with a 2-yr history of neck and right shoulder pain that was insidious at onset. Her pain was improved with rest, heat application and medical treatment. On physical examination, she had active myofascial trigger points in both upper trapezius muscles. Her cervical active range of motion

was within functional limits and painless in all planes. She had drooping shoulder on the left side. Adam's forward bending test was positive. A cervical and thoracic spine x-ray demonstrated defective fusion of posterior bony elements in lower cervical and upper thoracic vertebrae and lumbar scoliosis with a 15 degree curve angle. Apex of lumbar curve is L2. Axial T2 weighted cervical MRI showed deficient posterior lamina and defective fusion of posterior elements of C5 and C6 vertebra. Case Report 2: A 37-yr-old woman admitted to an outpatient physical therapy clinic with a 4-yr history of neck pain. Her pain was increased with neck movements, especially in the anteflexion. She had active myofascial trigger points in left upper trapezius muscle. Her cervical active range of motion was within functional limits in all planes but slightly painful. Neurologic examination was normal. A cervical and thoracic spine x-ray demonstrated defective fusion of posterior bony elements in cervical fifth vertebrae and thoracolumbar scoliosis with a 30 degree curve angle. Apex of thoracic curve is T9. Although cervical SD has rarely been reported, this report highlights that may be associated with orthopedic abnormalities such as scoliosis as well as cutaneous, neurologic and urogenital disorders.

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PERIODIC CHANGES OF THE PULSATILITY INDEX OF THE CEREBRAL ARTERY BY TRANSCRANIAL DOPPLER SONOGRAPHY AS A CLUE FOR LEPTOMENINGEAL CARCINOMA: A REPORT OF TWO CASES

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Leptomeningeal carcinomatosis (LC) results from the diffuse infiltration of leptomeninges by malignant cells originating from an extra-meningeal primary tumor site. It has been reported that the incidence of LC was 4 to 15% in patients with solid carcinomatosis, and the common causes of LC are breast cancer, lung cancer, and malignant melanoma. Patients with LC can present with various neurological symptoms and signs depending on the site of leptomeningeal invasion. The diagnosis of LC, however, can sometimes be difficult and challenging. It typically requires the demonstration of malignant cells in cerebrospinal fluid (CSF) which may require several lumbar punctures. MRI, especially gadolinium-enhanced MRI may play an important role in supporting the diagnosis of LC in patients with negative cytology in CSF. However, to our knowledge, there have been no reports on the periodic changes of the pulsatility index (PI) of the cerebral artery by transcranial Doppler sonography (TCD) in patients with LC. Herein we report two cases of to patients who complained of headache without positive neurological signs and who visited the outpatient department. The MRIs showed no positive results. Both of them were found to have a periodically changing PI of the cerebral artery and disappeared after intravenous mannitol, detected by TCD monitoring, which indirectly reflecting periodic intracranial pressure change. This prompted us to perform a lumbar puncture for each patient. As a result, we found LC from lung cancer, as demonstrated by CSF cytology and chest CT. Unfortunately, neither of them performed gadolinium-enhanced MRI which may help to explain the periodic changing PI of the cerebral artery. From the communication, we speculated that TCD monitoring may be helpful in LC diagnose in the further, but still need further research.

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A COMPARISON OF TRANSCRANIAL DOPPLER, TRANSTHORACIC ECHOCARDIOGRAPHY, AND TRANSESOPHAGEAL ECHOCARDIOGRAPHY IN THE DIAGNOSIS OF PATENT FORAMEN OVALE

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Objectives: Patent foramen ovale (PFO), the most common congenital cardiac abnormality, results from failure of the atrial septum primum and septum secundum to close completely. Recent studies have linked PFO in adults with cryptogenic stroke, migraine with aura, and decompression sickness. Echocardiographic techniques such as transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) have been accepted as diagnostic techniques for PFO. Several studies report that transcranial Doppler sonography (TCD) is more sensitive than TTE and TEE. This study aims to compare the accuracy of TCD, TTE, and TEE.

Methods: Subject who visited the Clinic Department of Neurology of the First Hospital of Jilin University from February 2010 to September 2012, and who performed TCD to detect PFO during normal respiration (rest) and during the Valsalva maneuver (VM) were recruited in the study.

Results: 955 subjects undergoing TCD and TTE, 599 (62.72%) TCDs were positive and 477 (49.95%) TTEs were positive. The difference was statistically significant ($P < 0.005$). Compared to the TCD reference standard, the sensitivity of TTE for PFO was 75.96%; specificity, 93.82%; positive predictive value (PPV), 95.39%; negative predictive value (NPV), 69.87%; and accuracy, 82.62%. Besides, 40 subjects undergoing both TCD and TEE, 39 subjects (97.5%) had positive TCDs and 34 (85.0%) had positive TEEs, with no significant difference ($P > 0.05$). Using TCD as the reference standard, the sensitivity of TEE for PFO was 87.18%, with a specificity of 100%, PPV of 100%, NPV of 16.67%, and accuracy of 87.50%. Futher, the TTE positive rate increased with increasing shunt grades, and the differences were statistically significant ($P < 0.005$), while the TEE positive rate increasing with the increase in shunt grade with no significant differences from TCD ($P > 0.05$).

Conclusions: Subjects who were suspected PFO should undergo TCD as the first diagnostic measure. The one whose TCD is positive can undergo TEE for anatomic information. TTE is inaccurate in PFOs with small shunts.

Session P3: Epidemiology

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ETIOLOGIES OF EPILEPSY AND HEALTH-SEEKING ITINERARY OF PATIENTS WITH EPILEPSY IN A RESOURCE POOR SETTING: ANALYSIS OF 342 NIGERIAN AFRICANS

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Purpose: The understanding of causation of epilepsy, especially in resource poor African countries where prevalence rates are very high, would aid strategies for primary prevention. This study sought to determine the causes of epilepsy in Nigerian Africans and health-itinerary of patients with epilepsy.

Method: This was an observational, cross-sectional descriptive study of consecutive newly diagnosed adult patients with epilepsy using a mixed-methods approach of face-to-face in-depth interview of patients' parents and relations, health care personnel who had given medical attention at any time and telephone interview. A structured interview schedule was used to obtain demographic information, details of seizure variables, health seeking itinerary and history of previous hospitalizations. Data was analyzed descriptively with SPSS version 17.

Results: Three hundred and forty two patients with epilepsy with a mean age of 31.4 ± 11.98 years participated in the study. Most of the patients (68.1%; 233/342) were unemployed and students. There were 270 (78.9%) patients with generalized epilepsy. No identifiable etiology was found in 37.7%, but of the remaining 62.3%, the commonest causes included post traumatic (19.6%), recurrent childhood febrile convulsions (13.2%), post-stroke (6.7%), brain tumors (5.9%), neonatal jaundice (5.3%), birth-related asphyxia (5%) and history of previous CNS infections (4.7%). Family history of epilepsy was obtained in 9.9%, all of whom had primarily generalized seizures. 61.4% of them sought initial attention with the traditional healers or in prayer houses.

Conclusion: This study showed the pattern of causes of epilepsy in Nigerian Africans. The health seeking behavior and itinerary of the PWE revealed a preference for traditional healers. There is need for health policies and epilepsy awareness campaigns to prevent causes of seizures and improve the knowledge of the public respectively.

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PREVALENCE OF STROKE IN LEBANON: A 2012 CROSS-SECTIONAL STUDY

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Introduction: Stroke prevalence in any country is a necessity because it measures the existence of the third cause of death on earth. Lebanon is one of the countries where few studies about the epidemiology of stroke have been conducted.

Methods: A cross-sectional study based on random telephonic calls has been conducted between January and March 2012 to fill in a questionnaire about the existence of a case and its demographic characteristics.

Results: A total of 1,779 questionnaires have been filled resulting in a stroke prevalence of 0.5% obtained after adjustment over each governorate's demographic characteristics (number of inhabitants, age and gender). A large difference (RR = 5.464; CI= [1.187–25.145]; p = 0.015) exists between male and female stroke prevalence aged between 60 and 80 (3.3 vs. 0.6% respectively).

Conclusion: Results were expected as Lebanon is a country positioned between developed and developing ones. Strict measures need to be installed to limit stroke incidence with a population that is getting older as it is the situation in developed countries.

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SEASONAL FLUCTUATIONS OF STROKE IN ARMENIA

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Background: Many researches have highlighted the influence of climate and season on mortality. However, there still remains much debate why certain countries experience dramatically higher rates of seasonal mortality than others. Although seasonal variation in the incidence of acute myocardial infarction, coronary artery disease and respiratory disease are recognized, it is less documented in stroke. The relevance of such studies is becoming more and more significant as climate change effects are widely investigated.

Aim: To determine whether stroke incidence and case fatality varied by seasons and which gruppes of population are more at risk.

Materials and Methods: Data of State Health Agency of Armenia on hospital registrations of stroke patients and outcomes. Data of State Statistical Service on population deaths causes for 2000–2010. The medical examinations' data of stroke inpatients hospitalized in II nd Yerevan Hospital with verified diagnosis of stroke.

Methods: Seasonal patterns of incidence, case fatality and mortality are described by comparing numbers of events per month.

Results: Monthly distribution of hemorrhagic and ischemic stroke reveals the same tendency: peak in the winter-spring and a summer-early fall decrease. Winter excess is more expressed in urban areas. The exceeding cases are mainly due to more frequently development of hemorrhagic stroke and ischemic stroke in left carotid artery in winter and vertebro-basilar strokes in spring. In September there was stable fall of stroke incidence and case fatality.

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AUTOIMMUNE COMORBIDITY IN MULTIPLE SCLEROSIS

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Objective: 1) To determine whether patients with multiple sclerosis (MS) have higher autoimmune comorbidity than controls; 2) to describe the type and frequency of autoimmune diseases (AID) in MS; 3) to investigate whether known autoimmune conditions predispose to MS; 4) to find out if the gender distribution differs between cases and controls; and 5) to determine the correlation between allergic asthma and MS.

Background: Autoimmune diseases, being treated by different medical specialties, are conventionally seen as separate entities, but a growing number of studies focus on their co-existence, especially MS with other autoimmune disorders. Several studies using various methods and design have investigated the co-existence of other AIDs and MS resulting in inconsistent and conflicting findings.

Design/Methods: A cohort of 1403 patients of both sexes with probable/definite MS, identified through the nationwide Danish Multiple Sclerosis Registry, with clinical onset between 2000 and 2004, aged 15–55 at onset. For each case, 25 control persons were drawn by random from the Danish Civil Registration System matched by sex, year of birth and residential municipality by January 1st in the year of onset of the first demyelinating symptom of the corresponding MS-case. The database was established by linkage of the Danish Multiple Sclerosis Registry to The Danish National Patient Register.

Results: In general the occurrence of AID was not significantly higher in MS cases than in controls, but we found a positive association for some specific AID's. Male cases with type I diabetes mellitus were more likely to develop multiple sclerosis: odds ratio (OR) =2.65 (95% CI 1.32–5.29, $p < 0.01$). Female cases did not have a higher risk of developing DM type I. Morbus Crohn occurred at a higher rate in cases preceding MS onset but the association was only found in males: OR = 5.00 (95% CI 1.45–17.28, $p = 0.01$). Regarding ulcerative colitis the OR for the co-occurrence with MS was in male cases 2.22 (95% CI 1.07–4.61, $p = 0.03$). Male cases had also a higher risk of developing SLE: OR = 6.25 (95% CI 1.33–29.43, $p = 0.02$). The only autoimmune disorder more frequent in women was pemphigus OR = 12.5 (95% CI 1.13–137.85, $p = 0.04$). However this association was based on a small number of observations. Our data did not support an association between MS and allergic asthma.

Conclusions: Autoimmune disorders are rare, but some of them tend to occur together with MS. Women have a greater autoimmune burden as expected, but men have a greater risk of developing MS if already having some specific AIDs. The coexistence of MS with some AIDs and the lack of association with others could lead to a better understanding of its pathogenesis. Knowledge about comorbidities more common in MS patients is important, as it affects clinical features, treatment decisions and responses, health outcomes, and inclusion in clinical trials.

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NEUROLOGIC MORBIDITY AND QUALITY OF LIFE IN LONG-TERM SURVIVORS OF CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA

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Objectives: Study neurologic morbidity and quality of life (QOL) among long-term survivors of childhood acute lymphoblastic leukemia (ALL). Also study risk factors for poor outcome.

Methods: Of the 350 eligible ALL survivors treated between 1984 and 2003, 162 agreed to participate in this study. All subjects answered an investigator administered questionnaire followed by face to face evaluation and examination by a neurologist. Questionnaire included instruments to quantify symptom severity or related disability. QOL data was assessed with the Medical Outcomes Survey Short Form 36 (SF36). Logistic regressions were performed to study risk factors.

Results: Clinical variables were similar between participants and non-participants. CNS leukemia was present in 39, cancer relapsed in 8, and cranial radiation was used in 23 patients. At least one symptom was reported by 80% and majority of these had more than one symptom. Dizziness was reported by 54 (33%); 18 experienced ≥12 episodes of dizziness/year. Fatigue was present in 35 (22%) and 14 (9%) reported moderate-severe fatigue. Periodic falls were reported by 25 (15%) and urinary incontinence by 23 (14%). Migraine was present in 51 (31%) and tension-type headaches in 49 (30%); 24 (15%) experienced both migraine and tension type headaches. Chronic daily headaches were present in 18 (11%) participants. Seizure history was present in 17 (11%) and 3 were on seizure medications; one had uncontrolled seizures. Neuropathic symptoms were present in 102 (63%), back pain in 37 (23%), attention impairment in 17 (10.5%), and ataxia in 44 (27%). Muscle stretch reflexes were

absent in 24 (15%), Karnofsky performance score was <90 in only 1, and moderate cognitive impairment on modified mini mental status examination was seen in 4 (2%) participants. Regression analyses showed that hypertension correlated with tension type headache; ataxia and neuropathy with dizziness; falls with fatigue, dizziness, headache, and neuropathy; urinary incontinence and constipation with neuropathy; seizures with history of CNS leukemia; and ataxia with radiation treatment. The mean SF 36 physical component summary (PCS) score was 52.4 (range 27.3–62.0) and mean mental component summary (MCS) score was 53.7 (range 22.4–67.7). Eleven (8%) survivors scored ≤40 on either summary scale suggesting impaired QOL. Lower PCS scores were associated with dizziness (Odds Ratio (OR) 6.8 [95% CI 1.6–28.2]); moderate-severe fatigue (OR 7.4 [1.5–36.4]); falls (OR 9.9 [2.5–39.7]); and urinary incontinence (OR 9.1 [1.7–47.9]). Lower MCS scores were associated with dizziness (OR 11.4 [2.8–47.0]); moderate-severe fatigue (OR 14.1 [2.9–68.9]); headache (OR 6.0 [1.2–29.3]); and neuropathy (OR 8.4 [1.04–68.0]).

Conclusion: While the majority of childhood ALL survivors report good QOL and functional status, a substantial proportion has neurologic signs and symptoms that warrant medical attention. Patients may not volunteer embarassing symptoms such as sphincter impairment or falls and these symptoms should be sought by treating physicians.

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A COMMUNITY STUDY OF PREVALENCE OF PRIMARY HEADACHES IN THE CITY OF KOLKATA, INDIA

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Objective: Headache is the commonest neurological disorder in the community and deeply impacts personal, familial and societal life. Comprehensive community study on headache from India is lacking. Our objective was to determine the prevalence of headaches and its subtypes in an urban community through house-to-house epidemiological survey.

Methodology: This was a cross-sectional study in the city of Kolkata employing a randomly selected sample based on National Sample Survey Organization blocks. The period of study was from 01.07.2010 to 31.03.2011. A house-to-house survey was conducted in two stages screening followed by confirmation by neurologist. Subjects were included if aged between 20–50 years and residing in their locality for a minimum period of 6 months. Final diagnosis was based on consensus from a group comprising neurologists, psychiatrists and neuropyschologist. Headache definition was based on standard criteria and classification as per International Headache Society Criteria (2004). 10% of randomly selected screen-negative individuals were re-examined by neurologists to unearth false negative cases. Headache frequency in last one year before prevalence period was only considered to avoid any memory bias.

Results: Pilot study showed sensitivity of 80.7% and specificity of 100%. This was applied to 2031 randomly selected subjects. A total of 346 cases with complaint of headache were detected; complete information was available for 332 cases. The crude prevalence of headache was 17.03% (95% Confidence interval 15.28–18.90). Sex specific prevalence was 6.45% among men (4.92–8.30) and 34.86% among women (30.85–39.25). Age-specific prevalence showed overall high rate between 25 and 39 years. Main subtypes of primary headaches were migraine (82.53%) and tension headache (1.5%). We carried out a case-control study to find out the underlying cause of high prevalence of migraine in our study.

Conclusion: Majority of subjects suffered from migraine headache. This contrasts with community studies from developed countries which document tension headache as the predominant type. Multiethnic studies have reported lower rate of headache among Asians as compared to Caucasians. However, we found comparable rate. Cause for factors behind high prevalence of migraine in this study will be discussed.

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COMPARATIVE STUDY OF COMPLEXITY ANALYSIS OF EPILEPTIC SCALP EEG RECORDS

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Seizure prediction is a challenging topic in EEG processing. The existence of the pre-ictal period is the basic requirement for genuine prediction of epilepsy. A thorough study on complexity of epileptic EEG data is highly needed for seizure prediction. Most methods use correlation dimension, Lyapunov exponent and regularity measures such as Sample and approximate entropy. Recently, fractal dimension methods, such as the Hurst exponent estimation has emerged as a new approach for examining the complexity of epileptic EEG records. The Hurst exponent is related to Fractal dimension, which measures the smoothness of the signal. Here a multilevel wavelet based Hurst exponent is proposed for measuring the complexity of EEG records of epileptic patients. The performance of this method is compared with power spectrum, Re-scaled range method, Wavelet transform method and with sample entropy and approximate entropy methods.

Objectives: A wavelet based method is proposed for measuring the complexity of EEG records of epileptic patients since wavelets are particularly apt for the analysis and synthesis of fractal processes such as EEG signals. Methods Wavelet Estimator for Hurst exponent The Hurst exponents of a time series signal can be estimated from its wavelet transform. If a 1/f like noise with Hurst exponent H is projected onto a wavelet basis with R vanishing moments and then var{dk}j is related to the scale by a power law with exponent 2H+1 Various estimators of H can be derived of

which the simplest is a least square fit of the linear model. By means of a regression analysis of a log-log plot of estimated variance, values of wavelet coefficients versus their scales. The parameter H can then be estimated from the slope of the regression line.

Results: The performance of the Hurst estimator using wavelet transform method is evaluated with a synthetic data of H = 0.6. The results are compared with that of power spectrum and R/S methods. Results show that the values of H are consistent irrespective of the length of the data. Seizure onset represents a transition from a relatively less orderly state to a more orderly state. The epochs later in the epileptic seizure is of greater complexity than early epoch. As seizure approaches, there is a transition from higher to lower complexity and then back to higher complexity prior to seizure termination. Comparison of the performance of the proposed work with sample entropy and approximate entropy on different data sets is also done. Results show that, H value gradually increases from preictal to ictal period in the case of 26 out of 58 seizures.

Conclusions: Compared to other Hurst estimation methods, the proposed wavelet based Hurst exponent estimator has several advantages, estimator is unbiased, implemented very efficiently allowing the direct analysis of very large data sets, and is highly robust against the presence of deterministic trends. Complexity of the algorithm is O (N); hence it can easily be implemented in real time.

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PREVALENCE AND INCIDENCE OF EPILEPSY IN ITALY BASED ON A NATIONWIDE DATABASE

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Background: Many researches have highlighted the influence of climate and season on mortality. However, there still remains much debate why certain countries experience dramatically higher rates of seasonal mortality than others. Although seasonal variation in the incidence of acute myocardial infarction, coronary artery disease and respiratory disease are recognized, it is less documented in stroke. The relevance of such studies is becoming more and more significant as climate change effects are widely investigated.

Aim: To determine whether stroke incidence and case fatality varied by seasons and which gruppes of population are more at risk.

Materials Used: Data of State Health Agency of Armenia on hospital registrations of stroke patients and outcomes. Data of State Statistical Service on population deaths causes for 2000–2010. The medical examinations' data of stroke inpatients hospitalized in II nd Yerevan Hospital with verified diagnosis of stroke.

Methods: Seasonal patterns of incidence, case fatality and mortality are described by comparing numbers of events per month.

Results: Monthly distribution of hemorrhagic and ischemic stroke reveals the same tendency: peak in the winter-spring and a summer-early fall decrease. Winter excess is more expressed in urban areas. The exceeding cases are mainly due to more frequently development of hemorrhagic stroke and ischemic stroke in left carotid artery in winter and vertebro-basilar strokes in spring. In September there was stable fall of stroke incidence and case fatality.

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ETIOLOGIES OF EPILEPSY AND HEALTH-SEEKING ITINERARY OF PATIENTS WITH EPILEPSY IN A RESOURCE POOR SETTING: ANALYSIS OF 342 NIGERIAN AFRICANS

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Sudden Unexplained Death in Epilepsy (SUDEP) Epilepsy is one of the very common neurological disorders of which about 50,000 people die each year. SUDEP has been used to describe a person who dies unexpectedly suffering from epilepsy. The cause of SUDEP is uncertain. Observations in individual cases have suggested possible cardiogenic, pulmonary, and primary neurologic etiologies. It may be that SUDEP is a heterogeneous condition. It has been commonly associated with generalized tonic clonic seizures between ages 20–50 years and rarely in children. The incidence of SUDEP increases with severity of epilepsy, and may be as high as 0.5 to 1 percent a year in those with severe refractory epilepsy. There are no strategies that have been shown to reduce the risk of SUDEP. Maximizing seizure control is recommended, including timely consideration of epilepsy surgery. Clinicians should counsel patients and when appropriate, family members, about SUDEP (especially patients with risk factors) to promote medical compliance and when discussing aggressive treatment of refractory epilepsy. In this presentation I will discuss the risk factors, potential mechanisms, outcomes and approaches to SUDEP with new guidelines.

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EFFECTS OF ADJUNCT 25-HYDROXYVITAMIN D ON RETINAL NERVE FIBER LAYER IN PATIENT WITH OPTIC NEURITIS: PRELIMINARY FINDINGS OF A RANDOMIZED, PLACEBO-CONTROLLED TRIAL

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Objectives: To evaluate the effect of oral vitamin D on the thickness of retinal nerve fiber layer (RNFL) in patients with optic neuritis (ON) by optical coherence tomography (OCT).

Methods: A phase II placebo-controlled randomized clinical trial conducted between July 2011 and November 2012 included 52 patients with confirmed unilateral ON aged 15 to 38 years and low serum 25-hydroxyvitamin D levels. The main outcome measures were changes in thickness of RNFL and macula 6-months after treatment. Patients were randomly allocated to receive 6-months of treatment with either 50,000 IU/week 25-hydroxyvitamin D or placebo.

Results: In the 27 patients treated with vitamin D, the mean (SD) thickness of RNFL decreased from 111.3 (18.9) μm at baseline to 91.4 (13.3) at the end of study period (P0.05). Average thickness of RNFL at the end of trial did not differ between groups.

Conclusions: Adding vitamin D to routine disease therapy had no significant effect on the thickness of RNFL or macula in patients with ON. A larger phase-III study is warranted to more assess the efficacy of this intervention.

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STROKE REGISTERS IN RUSSIA

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Background: During last 30 years in Russian Federation a lot of stroke epidemiology surveys have been performed, including WHO investigation of the stroke incidence (Hatano S. 1973, 1976) and the MONICA-Project (Thorvaldsen P. et al., 1995). Population-based stroke registers are the 'gold standard' for measuring stroke incidence in the population. It was convincingly demonstrated (Sudlow M.L.C., and Worlow C.L.M., Stroke 1996) that to grant the most reliable and comparable data, stroke register have to match following criteria: WHO definition of stroke; distinguished first-ever-in-a-life-stroke data; complete community-based case ascertainment; prospective study desing; large, well-defined, stable population.

Aim: to obtain the most reliable and comparable data about stroke epidemiology in Russian Federation based on the analysis of stroke registers.

Methods: Among 30 studies performed in different regions of Russia we identified 5 which could be considered as well matching criteria mentioned above. All these studies were carried out in the period no less than 3–4 years, in the population of more than 200,000 residents, with examination by the neurologists of the registers of all persons who have assumed the development of acute disorders of cerebral blood circulation. Patients with first-ever or recurrent stroke of all age groups were included. Follow up examinations were performed after 3 and 12 months. These studies were performed with the supervision of the Department of the Epidemiology of the Research Center of Neurology, Russian Academy of Medical Sciences. The definition of stroke was based on the WHO criteria. Because CT and MRI scanning was performed less, then at half of patients, defining of stroke subtypes was unreliable.

Results: Selected studies were performed in different years in some regions of Russia – Moscow (1972–1975), Novosibirsk (1981–1989), Krasnodar (1997–2000), Orel (2001–2004), Yakutsk (2002–2004). Overall population of 1,631,677 inhabitants was observed, ranging from 208,921 in Moscow to 630,000 in Novosibirsk. A total of 18,358 patients, with first or recurrent stroke were registered. Crude rates varied from 209.1/100,000 (95% CI 191.7; 228.4) in Yakutsk, to 320.8/100,000 (95% CI 302.2; 340.7) in Orel. Age-adjusted to the European population rate was also lower in Yakutsk 230.0 (95% CI 212.0; 250.0) and higher in Orel 352.9 (95% CI 338.6; 379.0). Age-adjusted incidence rate of first-ever stroke was from 167.0 (95% CI 151; 184) at Yakutsk to 258.0 (95% CI 241.0; 280.0) at Orel. So, more than 400,000 of Russian inhabitants have a stroke annually. Thirty-day case-fatality rates for stroke was 27–29% and the recurrent stroke was recorded at 27–31% in different centers.

Conclusions: Our data showed a high rate of stroke events (both primary and recurrent), in Russian population and allow to determine the upper and lower limits of the stroke incidence at Russian Federation.

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STROKE SUBTYPES AND FREQUENCY OF CAROTID STENOSES IN PATIENTS WITH ISCHEMIC STROKE

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Objectives: It is estimated that the stenosis of the internal carotid artery is responsible for 15–20% of all ischemic strokes, which is important, since stroke is second most common cause of death in the world. Also, stroke is the main cause of acquired disability in adults, and the second most common reason for dementia. Carotid stenosis is found to be more frequent in men than in women and its prevalence to increase with age. Therefore, objectives of this study were to find out the frequency of defined degrees of carotid stenosis and the type of atherosclerotic plaques in our region.

Methods: Study comprised 150 patients (77 males and 73 females) who were treated at the Neurology clinic of Clinical

Hospital Center Osijek (Eastern Croatia) during the year 2011. Average age was 72.03 years (range 45–93 years). 80% of examinees in the investigated group had arterial hypertension, 26.67% had high cholesterol, 31.33% had diabetes, 28.67% had cardiomyopathy, and 27.33% had hyperuricemia. Of all patients 64% had first-ever ischemic stroke, and 34% of patients had recurrent stroke. For classification of ischemic stroke subtypes, Trial of Org 10172 in Acute Stroke Treatment (TOAST) classification was used, which comprises large vessel stroke (LVS), small vessel stroke (SVS), cardioembolic stroke (CES), stroke with other cause or etiology (OUS), and undetermined stroke (US). In all patients the diagnosis of stroke was confirmed using computed tomography; for estimation of stenosis degree and type of atherosclerotic plaque Color Doppler Flow Imaging (ALOKA Pro-Sound SSD-5000 SV) was used.

Results: According to subtypes of ischemic stroke, 43.33% of patients had SVS, 30.67% had LVS, 14% had CES, 11.33% had US and 0.6% of patients had OUS. Frequency of carotid stenosis (large-vessel cerebrovascular disease) was 18.67% (19.48% in males, and 17.81% in females). According to degree of stenosis patients were divided in 4 groups: mild stenosis (0–49%) which was presented in 10% of patients, moderate stenosis (50–69%) in 2.67% of patients, severe stenosis (70–99%) presented in 2.67% of patients, and total occlusion (100%) in 3.33% of patients. The most common type was mixed plaque (15.33%), followed by stiff plaque (13.33%), soft plaque (5.33%) and ulcerated plaque in 0.6% of cases.

Conclusions: The most frequent subtype of stroke was SVS, which was expected because of high frequency of arterial hypertension and typical diet and lifestyle in continental Croatia. Relatively high frequency of atherosclerotic changes and carotid stenoses in our area corresponds to that of other countries (Switzerland, USA); also, it is somewhat more frequent in males. Concerning the type of plaque, there is a high frequency of mixed plaques, which is unfortunate, since they are also unstable; hence, there is a large risk of rupture and embolism as a result.

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PROFILE OF DEMENTIA AND COGNITIVE IMPAIRMENT NON-DEMENTIA IN MEMORY CLINIC OF CIPTO MANGUNKUSUMO HOSPITAL, INDONESIA

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Objectives: The purpose of this study was to investigate the profile and characteristics of dementia and cognitive impairment non-dementia in memory clinic of Cipto Mangunkusumo National Hospital. Profile of dementia in a memory clinic in Indonesia has not been reported.

Methods: This study retrospectively recruited patients with cognitive dysfunction in memory clinic of Cipto Mangunkusumo Hospital, Jakarta (the capitol of Indonesia), from January 2011 to December 2011. Diagnosis of dementia was made according to DSM-IV, and the subtypes of Dementia according to standard diagnostic criteria. Diagnosis of cognitive impairment non-dementia (CIND) was made according to MCI Working Group of the European Consortium on Alzheimer's disease 2005. Vascular Cognitive Impairment (VCI) patients in this data were CIND.

Results: Patients with cognitive impairment in this study were 162 people. The average age was 63.43 ± 8.2 years, minimum age was 50 years, and maximum age was 92 years. Male 96 (59.3%) and 66 female (40.7%). Patients with Dementia 52 (32.1%), patients with CIND 110 (67.9%). AD patients 8 (15.4%), VaD 25 (48.1%), mixed Dementia 11 (21.2%), FTD 2 (3.8%), others 6 (11.5%); 4 Head Injury, 2 SOL and 1 PDD. The average age of AD 70.5 ± 11.49 years, VaD 64.08 ± 9.08 years, mixed Dementia 61.73 ± 6.33 years. Risk factors of VaD were Hypertension 19 (76.0%), Diabetes Mellitus 7 (28.0%), Heart disease 5 (20.0%), and Stroke 20 (80.0%). CIND patients who qualify Vascular Cognitive Impairment (VCI) were 69 (62.7%), non VCI 41 (37.3%), 23 MCI, 18 others (4 PD, 3 Head Injury, 2 Epilepsy, 8 SOL, 1 infection). Risk factors of VCI were Hypertension 51 (73.9%), Diabetes Mellitus 25 (36.2%), Heart disease 24 (34.8%), and Stroke 50 (72.5%).

Conclusions: VAD are more than the AD, CIND are more than the Dementia, and VCI are more than MCI in our memory clinic. Hypertension and Stroke the leading risk factors in VaD and VCI.

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THE PATTERN OF EPILEPSY AMONG YEMENI PATIENTS

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Epilepsy is one of the most common neurological disorders worldwide. The pattern of epilepsy in 500 consecutive Yemeni patients is described. in this study men were more frequently affected than women. The mean age was 28.7 years; 82.4% of the patients were below 26 years. Most of the patients 298 (59.6%) were from rural area. A family history of epilepsy was positive in 115 (23%), and the consanguinity among the parents was found in 45 cases. Generalized seizures (71%) were more frequent than partial (29%) and complex partial seizures. The identified major Risk factors of the epilepsies were febrile convulsion in 68 (13.6%) patients, cerebral trauma in (11%). No specific etiology of the epilepsy was determined in the majority of the cases (71.8%). This result indicated that epilepsy predominantly affected children and young adults.

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RISK FACTORS OF VITAMIN D DEFICIENCY IN PATIENTS WITH WIDESPREAD MUSCULOSKELETAL PAIN

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Vitamin D deficiency is a worldwide health problem. Vitamin D deficiency in adults has been associated with proximal muscle weakness, skeletal mineralization defect, and an increased risk of falling. Patients with vitamin D deficiency commonly complain of widespread pain in the body. The aim of this study was to examine the prevalence of 25-hydroxyvitamin D deficiency in patients complaining of widespread musculoskeletal pain. In this cross-sectional study, 8,457 patients (7,772 females, 685 males), aged 46.7 (range 20–100) years were included. Serum 25-hydroxyvitamin D was measured with ELISA method according to the manufacturer's instruction. Patients were classified into two groups: 1) Patients with vitamin D deficiency (20 ng/ml). Prevalence of vitamin D deficiency was found to be 71.7%. A multivariate logistic regression model showed that low 25(OH) Vit D level was associated with gender, age and month. The risk of low 25(OH) Vit D was found to be 2.15 times higher in female patients and 1.52 times higher on March and 1.55 times higher on April. As a conclusion, this study indicates that Vitamin D deficiency should be taken into consideration in patients with widespread body pain, and some precautions such as sunbathe during summer should be recommended patients having risk of vitamin D deficiency.

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NEW ONSET SEIZURES IN ELDERLY: CLINICAL PRESENTATION AND ETIOLOGY OF FIRST EVER SEIZURE

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Objective: To study the possible etiologies and clinical characteristics of seizure in elderly population.

Method: All patients presented to our emergency room (ER) at King Fahad Medical City (KFMC) aged 60 years and above with their first seizure, were recruited. Seizures were classified according to the revised ILAE (International League against Epilepsy) classification into primary generalized, simple partial seizure (SPS) complex partial seizures (CPS) and secondary generalized (focal onset followed by secondary generalization). Events were identified as single or multiple (two or more episodes). Status epilepticus was defined as a seizure lasting more than 30 minutes or recurrent seizures without full return of consciousness between two episodes. All patients were subjected to: Detailed history, Physical and Neurological examination, lab investigations, routine EEG and brain imaging CT (Computerized Tomography)/MRI (Magnetic Resonance Imaging).

Results: Hundred and five patients were included in this study; their mean age was 69.75 years (range 60–93), 51 (48%) patients were male, 41 (39%) patients presented with partial seizures, out of those 14 (13.33%) had SPS, 27 (25.7%) had CPS, 3 (2.85%) patients presented with partial seizure with secondary generalization. Generalized tonic-clonic seizures were found in 37 (35.24%) of the patients, while 7 (6.65%) presented with status epilepticus. Myoclonic seizures were found in only 3 (2.85%) patients. Twenty nine (27.6%) presented with single seizure and 76 (72.38%) presented with multiple seizures. Stroke was the etiology of seizures in 66 (62.77%); out of those 9 (8.57%) were due to ICH (Intra Cerebral Hemorrhage) and 57 (54.2%) were secondary to ischemic stroke. Cortical infarcts were found in 42 (40%), 12 (11.43%) had acute symptomatic seizures and 30 (28.57%) had remote symptomatic seizures. Sub-cortical strokes were found in 15 (14.29%) of the cases, 5 (4.76%) with acute and 10 (9.52%) with remote injuiry. Brain Tumors were found in 18 (17%), 15 (14.29%) presented acutely, while only three (2.86%) presented remotely. No identifiable etiology was found in 15 (14.29%) and hence was labeled as cryptogenic. Acute symptomatic seizure was the commonest presentation with brain tumors followed by cortical strokes, with p-value of <0.0001. EEG abnormalities were found in 81 (77.11%) patients, 23 (21.9%) had focal epileptogenic abnormalities, 29 (27.62%) had generalized slowing, and 23 (21.9%) had either localized or lateralized slowing. EEG was normal in 15 (14.29%) patients, while not recorded in 9 (8.57%) patients. Brain imaging was abnormal in 90 (85.7%) patients, while normal or non-specific in 15 (14.29%).

Conclusion: The most common etiology of seizures in elderly was cerebro-vascular disease and most of them presented within two years of stroke. Commonest presentation was focal seizure, either simple or complex partial.

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RISK FACTORS AND MICROBIOLOGICAL DATA OF STROKE-ASSOCIATED PNEUMONIA IN NEUROLOGICAL INTENSIVE CARE UNIT IN CHINA

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Objectives: To confirm the independent clinical predictors, microbiological data, and cost of SAP used at the Neurological Intensive Care Unit (NICU) in China.

Methods: A retrospective study method was used to investigate and observe the clinical characteristics of three hundred and thirty-one consecutive patients with acute stroke in the NICU in China.

Results: Age ≥70 years ($p = 0.004$), diabetes ($p = 0.027$), consciousness disorders ($p = 0.012$), dysphagia ($p = 0.015$) and hypoalbuminemia ($p = 0.015$) were the independent risk factors for SAP in acute stroke patients. Of the 18 species of bacteria and 3 species of fungi analyzed in our study, Acinetobacter baumannii (25.9%), Klebsiella pneumonia (12.7%) and Candida albicans (12.7%) were the most commonly identified organisms. The mean cost of hospi-

talization (37,327 vs. 15,685, p < 0.001) and crude mortality (40.9% vs. 26.3%, p = 0.003) were higher in patients with pneumonia compared with patients who did not develop pneumonia.

Conclusions: We found that age ≥70 years, diabetes, consciousness disorders, dysphagia and hypoalbuminemia were independent risk factors for SAP in acute stroke patients. The cost of SAP is a huge economic burden; therefore, effective early prevention is particularly important.

Session P4: Treatment/Management

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INCIDENCE OF LUPUS ANTICOAGULANTS IN FIRST TIME TIA

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Background: Lupus anticoagulant (LAC) has been shown to precipitate thromboembolic events, including ischemic stroke. It is believed that the risk of ischemic stroke is particularly elevated in young women with LAC. This predisposition seems to be independent of other antiphospholipid antibodies, such as anti-cardiolipin and anti-B2-glycoprotein-I.

Objectives: We investigated the contribution of LAC on the incidence of first-time TIA and ischemic stroke in our TIA clinic. We evaluated the need to screen for LAC upon presentation to the TIA clinic.

Patients/Methods: Our Transient Ischemic Attack (TIA) clinic was designed to evaluate same day patients who presented with a TIA. This included a neurological examination, angiography, laboratory studies, a cardiac evaluation, and stroke education. We analyzed 350 patients as to the incidence of lupus anticoagulants in causing their symptoms. Each patient's clinical and laboratory data was reviewed as well as other etiologies of TIA.

Results: Of the 350 patients, 45% were female, 55% were male, and 60% were under the age of 60. None had prior strokes. Using ABCD2 scores, 45% scored 1–3, 40% scored 4–6, and 15% scored 6–8. The later were immediately hospitalized. After analyzing the data in all patients, we found 8% of the patients had lupus anticoagulant positivity as the only etiology contributing toward their TIA. Other etiologies of TIA in our patient population were: cardiac source including atrial fibrillation (35%), carotid stenosis >60% on the symptomatic side (26%), hypertension (76%), diabetes (58%), hyperlipidemia (52%), smoking (66%), vasculitis/lupus (12%), renal disease and other medical causes (25%), homocystine (15%), lupus anticoagulant (12%, 4% with additional etiologies), protein C/S deficiency (4%), and other (5%) (patients may have more than one etiology).

Conclusions: TIA is caused by various etiologies and some have multiple causes. Since the incidence of stroke following a TIA is very high, all causes should be ruled out, and when present, should be treated immediately and effectively. Our findings suggest that then incidence of LAC is higher than the general population in first-time TIA and ischemic stroke episodes. The presence of LAC is a significant cause, which should be diagnosed and treated in the presence of TIA, to prevent catastrophic strokes.

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SUCCESSFUL TREATMENT OF SYNDROME OF ARTERY OF PERCHERON

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Background: Syndrome of artery of Percheron is a rare cerebrovascular disease with no specific treatment and is associated with a high degree of morbidity and mortality from associated stuporous state and coma. It is thought that these symptoms are caused by damage to the hypocretin (Orexin) system. Hypocretin neurons originate in the hypothalamus and traverse through median thalamus, interacting through noradrenergic, serotonergic, dopaminergic, and histaminergic pathways, contributing to the arousal system by acting as on-off switches. Up to this point, treatment options have been limited. We have seen that treatment with a stimulant such as Modafinil, augments the sleep/wake cycle, thereby improving the state of stupor and coma. We describe cases of complete functional and cognitive recovery with use of Modafinil in the treatment of bilateral thalamic infarction.

Design/Methods: We present two cases with documented bilateral thalamic infarction, resulting from occlusion of the artery of Percheron. Both patients presented with deep stupor and coma but retained normal eye movements, pupillary responses, symmetric reflexes, and no motor paralysis. They were both over the age of 80, with similar risk factors, including diabetes mellitus, hypertension, and peripheral vascular disease. A magnetic resonance imaging of each brain showed acute infarction of the bilateral medial thalamus. The electroencephalogram revealed bilateral slowing, but no paroxysmal activity. Modafinil was started on the 3rd hospitalization day in both cases. Over the next few days, the patients showed improvement, were able to stay awake, were able to keep conversations, and became independent in all activities of daily living. On one occasion, both patients did not receive Modafinil for 2 days and both reverted back to deep stupors. Notably, upon restarting Modafinil, both patients quickly improved.

Results: Bilateral thalamic infarction occurs with hypoperfusion of the thalamoperforating arteries. The underlying etiology is primary atherosclerosis with embolism of the vertebrobasilar system. The clinical phenomenon may vary, however, somnolence is invariably present. Hypersomnolence is mediated by damage to the common pathways of arousal that tra-

verse through the thalamus. Drugs, such as Modafinil and other stimulants, cause wakefulness through intricate adrenergic pathways and the hypocretin system, resulting in restoring the sleep-wake cycle and arousal.

Conclusions/Relevance: Bilateral thalamic cerebrovascular accidents are uncommon and usually carry high morbidity and mortality due to causing stupor and coma. Modafinil successfully treats these patients by restoring their wakefulness as well as improving their cognitive and neurological function.

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STROKE AND POBLATIONAL – NEUROLOGICAL CENTERS STUDIES: CROSSED NESTED CASE-CONTROLS. THE NEDICES AND NETHERLANDS STROKE SURVEY

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Introduction: The Netherlands Stroke Survey was disclosed in 10 centers in the Netherlands with 579 patients with acute stroke, and prospectively followed, defining quality of care using multiple logistic regression models (Lingsma HF et al., 2008). NEDICES cohort, including 5,278 olser community patient (Neurological Disorders in Central Spain), detected prevalent strokes (1994–1997) and incident strokes (1997–1998), with surviving data until 2007 (Bermejo F, Diaz Guzman J).

Methods: Application of Akaike's Information criterion (AIC) in NSS methodics (difference in –2 log likelihood between the model with and without description) to clinical characteristics, other patient-related factors and QoC in nested-case controls in NEDICES cohort (with Philadelphia Geriatric Center Wellness-Scale) application.

Results: AIC results (square chi²-2* df)* in NSS study (5.46) corresponding to quality of care, were modified considering outcome/results factors according to wellness-and self-perceived health in post-stroke older community.

Conclusions: Stroke severity and risk factors were modified by sampling in level 1 (Age and phenotype), considering level 2 (stroke severity) and wellness variables ($r = 0.58$) ($p < 0001$).

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RELATIONSHIP BETWEEN OPTIONS OF ORIGINAL AMBULATORY BLOOD-PRESSURE MONITORING OF PATIENTS WITH NON-COMPLICATED ARTERIAL HYPERTENSION OF 1–2 STAGE AND DYNAMICS OF MEMORY DISORDERS UNDER THE INFLUENCE OF ANTIHYPERTENSIVE TREATMENT

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Objective: Arterial hypertension (AH) is a disposable risk factor of circulation disorders, particularly of cerebrovascular disorders (CVD). One of the earliest signs of CVD is cognitive, especially memory disorder (MD). By now it has been revealed dependence of evidence of MD from intensity of AH and reduction of MD under the antihypertensive treatment (AHT). One of the methods of examination of patients with arterial hypertension, estimating of basic circadian characteristics of AH is ambulatory blood pressure monitoring (ABPM). Our study displays options of ABPM, relating with positive dynamics of MD under the AHT.

Design and Method: 78 non-complicated with stroke, myocardial infarction, diabetes mellitus AH 1–2 stage patients (age level 57.4 ± 5.9; 38 male, 40 female) have undergone detailed examination before and after AHT. Examination included ABPM, echocardiography, MRI, duplex scanning of main heard arteries and detailed neuropsychological testing. Validity of correlation of MD dynamix with results of ABPM detected according to Mann-Whitney U-test.

Results: 33 patients had memory improvement, 5 ones had further impairment of memory and memory of 40 patients hadn't been changed. Memory improvement revealed in patients with originally lower mean values of systolic BP (SBP): in the daytime (131.25 ± 12.76 vs 138.28 ± 14.42; ð = 0.0415), by night (112.85 ± 11.97 vs 123.79 ± 16.44; ð = 0.0082) and over the entire circadian period (124.9 ± 12.6 vs 133 ± 15.28; ð = 0.028964) and with normalized overnight reduction of SBP (13.82 ± 4.98 ïðîòèâ 10.31 ± 6.61; ð = 0.031167).

Conclusions: Improving impairment of antihypertensive treatment on memory disorders had been revealed in patients with originally lower values of systolic blood pressure according to ambulatory blood pressure monitoring, such as mean values of systolic blood pressure in the daytime, by night, over the entire circadian period and with normalized overnight reduction of SBP systolic blood pressure.

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FACTORS INFLUENCING RESPONSE TO CORTICOSTEROID IN CHRONIC INFLAMMATORY DEMYELINATING POLYRADICULONEUROPATHY

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Background: Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) is an immune-mediated chronic progressive or relapsing-remitting neuropathy with motor weakness or sensory symptoms, which develops over at least two months. The CIDP is a kind of treatable disease and early initiation is important to prevent further loss of nerve. There have been many studies searching for effective and proper medical treatment in CIDP, but there was not well-established criteria about which treatment should be considered preferentially in each case. Corticosteroid have been widely used for treatment of CIDP, and some studies have documented the beneficial effect of corticosteroids on weakness and disability in CIDP, but little is known about the significant factors which are related to effect of corticosteroid. Objective To identify clinical or electrophysiologic factors influencing to efficacy of corticosteroids in CIDP patients.

Methods: The 46 patients (24 men and 22 women) diagnosed with definite, probable or possible CIDP according to European Federation of Neurological Societies/Peripheral Nerve Society (EFNS/PNS) criteria were included. Patients were evaluated with medical assessment including neurological examination, routine laboratory tests and electrophysiological tests. Patients were evaluated with MRC sum score and INCAT disability scale at baseline and at 6 months after corticosteroid treatment, and assessed about each demyelinating parameter of electrodiagnostic criteria according to EFNS/PNS. To analyze the association between clinical or electrophysiological factors and effectiveness to steroid, patients were grouped according to their response to steroid treatment: steroid-responsive or unresponsive group.

Result: Twenty patients with CIDP were classified to steroid-responsive group and twenty-six into steroid-unresponsive group. The duration of disease in steroid-responsive group was significantly shorter compared to steroid-unresponsive group ($p = 0.042$). The nerve conduction studies showed that the number of nerves with reduction of motor conduction velocity in steroid-responsive group was more than that of unresponsive group ($p = 0.05$).

Conclusions: In this study, we identified that the duration of disease and motor nerve conduction velocity were significant factors which were correlated with effectiveness of steroid treatment in patients with CIDP. In our result of NCS, the number of nerves with reduction of motor conduction velocity in steroid-responsive group was significantly more than that of unresponsive-group. There was no significant difference in other parameters between two groups, but they showed a definite trend toward a increased number of all demyelinating features in steroid-responsive group compared to unresponsive group. Our results may be helpful to decide more proper treatment in CIDP patient in CIDP patient, and to prevent long term disability.

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TRANSCRANIAL DOPPLER IN NEUROLOGICAL EXTREMES, WHAT CAN WE LEARN?

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Transcranial Doppler (TCD) has been utilized in the neurocritical care domain mainly for its ability to diagnose vasospasm associated with aneurysmal subarachnoid hemorrhage. Dynamic TCD testing and various indices generated from the TCD hold promising potential in the diagnosis and follow up of patients with neurological disease. The focus of this presentation is to highlight the use of the TCD and its various parameters in patients with extreme neurological deterioration and to demonstrate through clinical cases, how this test dramatically altered the management of these patients in an objective manner.

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EARLY ABNORMAL TRANSIENT HYPEREMIC RESPONSE TEST CAN HELP PREDICT DELAYED ISCHEMIC NEUROLOGIC DEFICIT IN SUBARACHNOID HEMORRHAGE

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Delayed ischemic neurological deficit (DIND) due to vasospasm, is a common cause of morbidity and mortality in patients suffering from subarachnoid hemorrhage (SAH). There is no perfect diagnostic tool for DIND. Little is known on the initial autoregulation state in patients presenting with aneurysmal SAH. We present our experience in the early use of the transient hyperemic response test, a dynamic transcranial Doppler (TCD) examination, as a predictor of clinical DIND in a cohort of patients with SAH. A total of 15 patients were analyzed. We found that 5 out of the 6 patients (83%) with symptomatic DIND had an abnormal THRT ($p = 0.04$). If we included the THRT on the asymptomatic DIND patients, the global cohort incidence of DIND was 53.3%; witha significant predictability of THRT to future development of DIND ($p = 0.0002$) Early abnormal THRT may predict future development DIND in patients with SAH, independent of flow velocities or the clinical grade of the SAH. A prospective study is needing to confirm this finding.

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MYASTHENIA GRAVIS: THYMECTOMY AND QUALITY OF LIFE

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Objectives: Myasthenia gravis (MG) is an autoimmune disease manifested by muscle weakness and fatigability. People

with MG often experience downward fluctuations in physical and mental ability. Quality of life is impaired in MG. Thymectomy has become increasingly accepted as an efficacious procedure for MG. The purpose of this study is to investigate the quality of life in a patients with MG and to determine the prognostic factors predicting MG outcome after operation.

Methods: A total of 24 subjects (mean age 53; 75% women) was divided into two groups, first group with 12 patients after extended trans-sternal thymectomy (TY) and second one is consisting of 12 patients submitted to conservative treatment (CT) according to age and gender. The following data were analyzed: gender, age, and age at the beginning of symptoms, illness duration, follow-up time and type of medical treatment. The patients were evaluated clinically using a quantified MG clinical score (QMGS) and tested by SF-36 self-reported.

Results: We found out improved (normal SF-36 items and lower QMGS) 14 cases (TY 9, CT 5), improved with partial and minimal limitation 6 cases (TY 2, CT 4), and downgraded (bad SF-36 items and higher QMGS) 4 cases (TY 1, CT 3). No death was found in this group. Clinical remission was reached by 25% patients (3 women), who had thymectomies in the first year of the disease.

Conclusions: Obtained data revealed that thymectomy has advantages over conservative treatment in clinical improvement and quality of life. There were statistical differences between the conservative treatment and thymectomy groups. Our results showed that patients with less than 1 year's duration of disease have a better prognosis.

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PATIENTS' KNOWLEDGE AND ATTITUDES TOWARD TREATMENT AND CONTROL OF HYPERTENSION: A QUESTIONNAIRE SURVEY IN JAPANESE ELDERLY SUBJECTS

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Objectives: Hypertension is a leading risk factor for diseases in elderly people, including cardiovascular disease. Problems with compliance in treatment and illness management have frequently been traced to differences between patients' explanatory models of illness and the biomedical model. The purpose of this study was to investigate patients' knowledge and attitudes toward treatment and control of hypertension to determine the explanatory models of hypertension in Japanese elderly people.

Methods: A group of 157 subjects (aged 48–79 years) were given a questionnaire in our hospital, including patients with hypertension. The patients with dementia were excluded. The questionnaire included questions regarding the criteria for hypertension in Japan, diseases associated with hypertension, and the reason why blood pressure should be controlled.

Results: Of all subjects, 46.5% suffered from hypertension, and 35.0% were taking oral medication. Most of the subjects did not correctly answer the question regarding the criteria for hypertension. In the question regarding the reason why blood pressure should be controlled, of all subjects, 51.5% answered that it was because hypertension results in fainting, cerebral infarction, hemorrhage, or myocardial infarction. However, only 15.9% of respondents referred to atherosclerosis or other systemic diseases.

Conclusions: The questionnaire-based study indicated that many elderly people took medication for hypertension without sufficiently understanding hypertension. For control of blood pressure and prevention of systemic diseases associated with atherosclerosis, it is important to provide correct health care education regarding hypertension in addition to the medication.

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ANALYSIS OF RECURRENCE RISK FACTORS AFTER ANTIEPILEPTIC DRUG WITHDRAWAL IN 173 PATIENTS

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Objective: To observe risk factors for recurrence after withdrawal from antiepileptic drugs. Method 173 patients between 14 and 80 years of age were grouped according to defined risk factors for recurrence.

Result: Of 173 patients, 119 patients (68.79%) had relapsed. In multivariate analyses with logistic models, the following were determined to influence seizure recurrence: age at onset of epilepsy, course of epilepsy longer than 6 months prior to AED treatment, and absence of EEG follow-ups during the drug withdrawal or follow-up periods.

Conclusion: Although the decision to discontinue AED treatment necessitates individual evaluation of each patient, our study suggests that there may be a high risk of recurrence in those with an early onset of epilepsy, course of epilepsy longer than 6 months before initiation of AED treatment, and absence of EEG follow-ups during the drug withdrawal or follow-up periods.

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TUMOR LIKE PRESENTATION OF CNS TUBERCULOSIS: A RETROSPECTIVE STUDY FROM SAUDI ARABIA

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Introduction: Tuberculosis is is a formidable disease and the world's second commonest cause of death from infecious disease, the first being human immune deficiency virus (HIV). The World Health Organization (WHO) estimates that nearly one third (1.9 billion people) of all the people in the world are infected with M. tuberculosis. It has probably killed more than 100 million people over the past 100 years. It is endemic in most of the developing countries and resurgent in those countries with high rates of HIV

infection. Although 85% of tuberculosis occur in the lungs, 15% cases occur outside the respiratory system with central nervous system (CNS) being the second most common site of involvement. CNS tuberculosis accounts for approximately 1% of all of disease caused by Mycobacterium tuberculosis and it carries the worst prognosis than any other form of tuberculosis4. Tuberculous meningitis is the commonest form of CNS tuberculosis that may result in hydrocephalus, brain infarction, and death if left untreated.

Methods: We conducted a retrospective chart review of all cases of CNS TB seen in King Abdulaziz Medical City (Jeddah) over a 10 year's period (January 2003 to December 2013). A total of 120 patients were identified. While most patients presented with either tuberculous meningitis or tuberculoma, nine cases presented with clinical and radiological features suggestive of brain tumor. Diagnosis was established either intraoperatievly when frozen section were reviwed or postoperatively when the masses were resected (histological finding of granuloma).

Results: One patient died and another patient had severe neurological deficit. The rest of patients recovered after recieving the anti tuberculous treatment. HIV testing was not done in all cases, even after diagnosis was established. Although magnetic resonance spectroscopy (MRS) is a valuable modality in the diagnosis of different types of space occupying lesions, it was utilized in only one patient. Even in this case, the result was deceiving suggesting the diagnosis of brain tumor rather than TB. Intraoperative frozen section were only utilized from 3 patients. In all cases neither symptoms or signs of pulmonary TB were found nor work up for systemic TB was done. Unfavourable outcome were seen in elderly patints, posterior fossa TB, and in those who underwent complete resection of the mass.

Conclusion: More utilization and experience of MR Spectroscopy should be established in the evaluation of brain space occupaying lesions. Frozen sections were not routinely done which could have prevented morbidity from resection. Once the diagnosis of TB is confirmed by biopsy, resection could be avoided. CNS TB should be included in the differential diagnosis of brain space occupaying lesions in Saudi Arabia and all other endemic areas. The abcense of constitutional and pulmonary symptoms of TB are deceiving. HIV testing should be routinely done in all cases of CNS TB. More epidemiological, nationwide studies are needed to establish guidelines for early detection and successful outcome of this rising health problem.

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CEREBRAL REACTIVITY AND INITIAL ORTHOSTATIC HYPOTENSION DURING ACTIVE ORTHOSTATIC TEST IN PATIENTS WITH ESSENTIAL HYPERTENSION AND CEREBROVASCULAR DISEASE

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Objective: The aim of our study was to investigate the relationship between the cerebral reactivity (CR) and the initial orthostatic hypotension (IOH) in elderly patients (pts) with essential hypertension (EH) and cerebrovascular disease (CVD).

Design and Method: 30 pts (9 M, 21 F) with EH grade I-III, av.age 68 ± 5 years. In all pts, after examining neurologist diagnosed discirculatory encephalopathy I-II, 2 pts had a history of transient ischemic attack, 1 patient had acute ischemic stroke more than a year ago. Pts received regular antihypertensive therapy excluding the administration of drugs at day of the test. During active orthostatic test (AOT) blood pressure (BP) (beat to beat) and HR measured continuously and non-invasively using the 'Task Force Monitor' ('CNSystems' Austria). IOH criteria was considered the onset of symptoms of cerebral hypoperfusion associated with a reduction in systolic (SBP) ≥ 40 mm Hg and/or diastolic blood pressure (DBP) ≥ 20 mm Hg in the first 5–15 seconds orthostasis (Wieling W., 2006) and/or the identification of the initial 'uncompleted' depressor reactions of BP (Rogoza A et al., 2008).

Cerebral blood flow was monitored in the middle cerebral artery (MCA) by transcranial Doppler ultrasound device 'Angiodin 2K' ('BIOSS', Russia). CR was assessed by hypercapnic test (HT) with a 30-second delay of spontaneous breathing. CR was calculated:

Kr* = Kr2/Kr1, where Kr1 – average linear velocity of blood flow in the MCA initially, Kr2 – during the test (N = 1.3–1.6). The statistical analysis was carried out by nonparametric methods of Mann-Whitney with Statistica 6.0.

Results: In 5 pts was found IOH appropriate criteria Wieling W. and 4 pts had the criteria of 'incomplete' depressor response. In 7 out of 9 (78%) pts with IOH was found decreased CR (Kr* <1.3). However, in the group without IOH reduced CR was observed in only 7 of 21 (33%) pts (p = 0.056). Furthermore pts with IOH registered significant reduction Kr*, compared with pts without IOH (1.24 ± 0.03 vs 1.35 ± 0.03, p = 0.044).

Conclusion: In elderly patients with essential hypertension and cerebrovascular disease the presence of initial orthostatic hypotension associated with a reduction in cerebral blood flow reactivity.

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TYPES OF INITIAL ORTHOSTATIC REACTIONS DURING ACTIVE ORTHOSTATIC TEST IN PATIENTS WITH ESSENTIAL HYPERTENSION

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Aim: The aim of the study: to investigate the initial orthostatic reactions (IOR) during active orthostatic test (AOT) in patients (pts) with essential hypertension (EH).

Materials: 99 pts (30M, 69F), 57.4 ± 1.1 ys with EH grade 1 or 2.

Methods: During AOT BP (beat to beat) and HR measured continuously and non-invasively using the 'Task Force Monitor'. Daily rhythm of SBP was assessed by BP-24 hour monitoring with 20 min day time intervals and 40 min at night time. ('BPLab', Russia).

The statistical analysis was carried out by nonparametric methods of Mann-Whitney and Fisher exact test with Statistica 6.

Results: the average hemodynamics BP (BPah) drop of 10–30 mm Hg or more were registered in all pts in the first 15 sec after standing. At the analysis it is revealed 2 different types of the reaction BP. Type I (n = 62) observed short-term drop BPah more than 18 ± 8 mm Hg after standing with restoration by 15 sec on 75–100% from an initial level baseline. Type II (n = 37) revealed pronounced decrease BP reaction 22 ± 9 mm Hg, but not restoration by 15 sec – initial orthostatic hypotension (IOH). In pts with II IOH was registered higher day DBP [mm Hg] (92 ± 1.9 vs 87.5 ± 1.5, p < 0.05) and more frequent syncopes (13/62 vs 24/37, p < 0.001), and had significant abnormality of nocturnal fall of SBP in comparison with type I (8,91.6 vs 12,41.1; p < 0.05). The groups were comparable by left ventricular mass index (II type – 169,96.1 vs I type 169,45.01; p = 0.5).

Conclusions: During active orthostatic test the prolonged initial depressor reactions are associated with higher frequency of syncopes and disturbance of circadian rhythm of blood pressure in patients with essential hypertension.

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QUALITY OF LIFE IN PATIENTS WITH MS AND D VITAMIN LEVEL

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Purpose: 25 (OH) vitamin D3 decreases in autoimmune diseases such as multiple sclerosis is associated with increased risk of disease activation and the formation of these diseases, although there is debate about the work available. Duration of illness in patients with MS, spasite degree held, number of limbs ve VitD level of this study was to determine the relationship between disease activity.

Materials and Methods: The study of 40 MS patients as a control group of healthy subjects and his family any, rheumatic or metabolic bone disease and 40 healthy participants were enrolled. Disease duration, spasitisite Ashworth scale for rating, joint count, and Quality of Life in Multiple Sclerosis (MSQOL)-54 scales were based. Statistical analysis of duration of disease, spasitisite, joint count and quality of life was assessed MS. Allparticipants vitD3 levels HPLC (high-pressure liquid chromatography) were measured by. Serum levels of vitamin D, 10 ng/ml Under VitD deficiency, vitD deficiency among 10–30 ng/ml, 30 ng/ml of over were classified as adequate.

Findings: The study of 40 MS patients as a control group of healthy subjects and his family any, rheumatic or metabolic bone disease and 40 healthy participants were enrolled. MS patients, average age: 38.1 ± 13.8 in the control group, mean age was 43.7 ± 9.6. In terms of gender, the MS group of 15 men (25.0%) and 25 women (75.0%) consisted of from. The control group of 13 men (32.5%), 27 women (67.5%) consisted of from 62.5% of patients with MS of 25 (OH) Vitamin D levels <10 ng/ml, 25% of levels of 10–30 ng/ml, 12.5% detected in 25(OH) VitaminD level >30 ng/ml were 2.5% of the control group, vitamin D levels <10 ng/ml, when 37.5% of vitD level of 10–30 ng/ml, 60% of vitD level >30 ng/ml; MS patients, vitD level of the control group mean vitD was significantly lower than average. Disease duration, spasitisite degree and MS quality of life scale joint count of vitD was any relationship between groups MS patients, vitD levels and disease duration, spasitisite degree of joint count-compare a negative significant correlation was found (p = 0.042). Considering these differences of vitD deficient group other disease duration of vitD were higher in groups vitD deficiency scale spasitisite other patients in the group with vitD was found to be higher than in groups (P < 0.001) vitD deficient group, the number of patients with extremity held the other 25(OH) vitD was found to be higher than in groups (P < 0.001) quality of life in multiple sclerosis (msqol)-54 scales in the evaluation of patients with multiple sclerosis low vitD averaged 9.4 ± 6.3, with no patients, vitD mean: 15.2 ± 9.8 respectively. VitD compared with the mean difference was statistically significant (p = 0.006).

Result: Vitamin D levels according to criteria determined by the number of MS disease duration-spasitise-held joint relationship is evident in the clear.

Session P5: Neurosurgery

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OUTCOME OF TEMPORAL LOBECTOMY FOR INTRACTABLE EPILEPSY: EXPERIENCE FROM SINGLE EPILEPSY CENTER IN SAUDI ARABIA

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Introduction: To review our experience of temporal lobe epilepsy and assess clarify whether the pathology in the resected temporal lobe has positive predictive value for good outcome of temporal lobectomy in refractory temporal lobe epilepsy.

Material and Method: Retrospective analysis was conducted in 80 patients underwent anterior temporal lobectomy for medically refractory temporal lobe epilepsy between January 2003 and December 2010. Demographics measures, pathological entities, and typical factors influencing seizure outcomes were evaluated.

Results: Seizure-free outcome in the entire patient cohort was 79% at a mean follow-up of 71 months. A significant factors predicting Engle class 1 outcome on multivariate analysis was age at surgery (P = 0.001), gender (P = 0.017), and duration of epilepsy (P = 0.001). The type of pathology (in 64 patients) or the presence of dual pathology (in 14 patients) in the resected temporal lobe was not associated with Engle class 1 outcome (P = 0.444 and P = 0.396). Complications included one patient had wound infection, 2 patients had transient aphasia, and one patient had pulmonary embolism.

Conclusions: Despite significant association of neocortical abnormalities in temporal lobectomy, which supports the concept that good outcome is obtained when mesial and neocortical structures are removed, the different types of single or presence of dual pathology were not predictors of successful seizure.

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TISSUE OXYGEN MEASUREMENT FOR PATIENTS WITH SEVERE BRAIN INJURY AS A PART OF MULTIMODAL MONITORING

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Objectives: Multimodal monitoring is of vital importance in neurointensive care. In recent years, multimodal monitoring has gradually incorporated also the measurement of tissue oxygen in the brain tissue.

Methods: We present a study of five patients with severe brain injury where addition to the usual ICP monitoring the measurement of PtiO2 was applied. All patients had severe brain injury (GCS ≤7) after motor accident. The first patient had subdural haematoma and severe brain edema, the others had subdural and epidural haematoma, severe brain contusion and edema with subarachnoid haemorrhage. All underwent acute neurosurgical removing of haematomas and the therapy was managed according standard protocol of EBIC together with deliberate mild hypothermia consequently.

Results: In the first patient over-treshold values of PtiO2 were obtained after two hours of targeted treatment. The value of PtiO2 was higher than 15 mm Hg for the whole period of measurement In other patients. The Glasgow Outcome Scale was 15 after two month of intensive rehabilitation in four patients.

Conclusions: Measurement of PtiO2 provides continuous quantitative data which contributes to the correct management of treatment and important prognostic and pathophysiological data for the detection of secondary brain injuries. Even though the PtiO2 value for hypoxia has not yet been unequivocally determined, there is apparently a direct link between low values of PtiO2 and higher morbidity and mortality.

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NEONATES WITH DISEASE STATES THAT ARE CHARACTERIZED BY INCREASED LEVELS OF CORTICOIDS MAY BE ESPECIALLY VULNERABLE TO THE DEVELOPMENTAL EFFECTS OF GENERAL ANESTHESIA

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Objectives: Six of ten human epidemiological studies found significant neurological and cognitive abnormalities in children who were exposed to general anesthesia during the early postnatal period. It is obvious that, the results of human studies could be even more distinct if the design of these studies was based on a better understanding of the specific mechanisms mediating the side effects of neonatal anesthesia and the unique vulnerability of young patients. The role of the limbic-hypothalamic–pituitary–adrenal (LHPA) axis in the developmental effects of neonatal anesthesia was studied by exposing postnatal days 4–6 (P4-P6) rats to sevoflurane, isoflurane, propofol and etomidate. Etomidate is both an anesthetic and an inhibitor of corticoid synthesis.

Methods: 6.0% Sevoflurane and 3.4% isoflurane over 3 min were used for anesthesia induction and anesthesia was maintained with 2.1% sevoflurane and 1.2% isoflurane. Rat pups received 40 mg/kg, I.P., propofol and 8 mg/kg, I.P., etomidate for the first 60 min, and then 20 mg/kg propofol or 4 mg/kg etomidate every 60 min (up to five injections). Non-anesthetized controls were separated from their dams for times equal to the anesthesia duration. Trunk blood samples for corticoid measurements were collected immediately after sevoflurane/isoflurane termination and 60 min after the last administration of propofol/etomidate. EEG activity was recorded for 1 hr before and 1 hr after the start of anesthesia. Prepulse inhibition (PPI) of the acoustic startle response was assessed when the rats achieved 83 days of age.

Results: Sevoflurane and isoflurane for 6 hrs or propofol (5 injections) resulted in a multifold increase in serum levels of corticosterone and aldosterone. The increase in the corticoid levels in animals anesthetized with etomidate (5 injections) was insignificant. Anesthesia with propofol was associated with episodes of seizure-like EEG patterns, similar to those previously reported for sevoflurane. Etomidate did not cause seizure-like EEG patterns. The Na+–K+–2Cl– co-transporter inhibitor bumetanide or the mineralocorticoid receptor antagonist RU28318 depressed seizure-like EEG patterns associated with propofol. Anesthesia with propofol, and to a lesser extent with etomidate, resulted in impairment in sensorimotor gating function, similar to the impairment previously reported for sevoflurane and isoflurane.

Conclusions: Our results suggest that propofol, sevoflurane and isoflurane produce developmental effects via similar mechanisms that involve an anesthetic-induced increase in the corticoid levels and increase in neuronal activity.

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EVALUATION OF FRAMELESS DEEP BRAIN STIMULATION

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Objective: Deep brain stimulation (DBS) is an established modality of treatment for a number of neurologic conditions such as Parkinson's disease, essential tremor, dystonia, obsessive compulsive disorder and epilepsy. About 30% of deep brain stimulating (DBS) electrodes in the United States are placed using a frameless stereotactic system. The purpose of this presentation is to review our experience and comment on aspects specific to this technique.

Methods: A retrospective review of all frameless DBS cases was conducted. The indications, complications, outcome and, when indicated, long term follow-up was obtained. Six technique specific complications were looked for:

1. Due to skull fidutial screw placement (5 are placed, 4 needed for good accuracy).
2. Due to skull mounted aiming device placement (fixed to skull with 3 screws).
3. Damage to previously implanted DBS lead by the screws.
4. Lead removal and repositioning due to poor clinical result.
5. Screw site infection.
6. Intracerebral hematomas as a reflection of poor accuracy resulting in inability to avoid blood vessels.

Results: The first frameless DBS surgery in this series was done in 2004. Eighty seven DBS electrodes were placed by a single surgeon using a frameless technique. Five were for seizure detection and treatment using a responsive neurostimulation system (Neuropace) and the remaining, about equally, for Parkinson's disease and essential tremor. Following the above 6 complication categories, the findings are listed below:

1. In 2 instances (2.3%) the position of one of the skull fiducials turned out to be too close to the skull mounted device resulting in dropping this fiducial from the registration. This did not have any ill effects since the system is built to maintain a good accuracy with 4 skull fiducials.
2. In one case (1.2%), one screw broke during fixing of the skull mounted aiming device to the skull. The device was slightly rotated around its axis and refixed. There were no sequelae.
3. None of the previously placed leads were damaged by the screws when the contralateral DBS was implanted.
4. No lead had to be removed and repositioned due to poor clinical outcome which, if it happened, could have been a reflection of poor accuracy.
5. There was one case (1.2%) of possible chronic low grade infection/chronic scab formation at a previous skull fiducial site that is not needing any treatment in an 88-year old patient.
6. One patient (1.2%) developed an intracerebral hematoma 4.5 days postoperatively. He had had an uneventful surgery. He was a poorly controlled hypertensive. He recovered well and had the contralateral DBS implanted 8 months later. Given the 4.5 days delay between surgery and the bleeding, the hemorrhage is not a reflection of poor accuracy.

Conclusions: 1. Our experience in 87 frameless DBS has been gratifying and supports its continued use. 2. The technique specific complications have been minor and infrequent. 3. Its advantages are increased patient comfort and decreased operating room time expense since the stereotactic planning is done outside the operating room.

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DETECTION OF GLIOBLASTOMA BRAIN TUMOR CELLS USING SPECTROPEN

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In this study, we employ a handheld spectrometer, SpectroPen, to detect fluorescence emission from U87 EGFRvIII glioblastoma cells in-vitro in order to test the device for in-vivo use. We also examine the sensitivity of SpectroPen, or the minimum fluorescence intensity detected and the corresponding number of cells. Clinically, SpectroPen is relevant for tumor excision, in which the surgeon removes the tumor mass. Some cells do, however, remain in the tumor margins due to the fact that there are cells that may be (1) impossible to see with the naked eye or (2) the surgeon may be unable to reach the area without causing irreversible damage to the patient. For highly aggressive cancers such as glioblastoma, it is of prime importance to eradicate as many tumor cells as possible: tumor recurrence corresponds closely to cancer cells left in the body. SpectroPen enables a physician to safely and efficiently excise as many tumor cells as possible. This device operates by detecting fluorescent emission from protoporphyrin-ix, a metabolite of 5-ALA dye that the tumor cells selectively accumulate upon incubation with the dye. The protoporphyrin-ix is 'excited' by violet light (405 nm) and subsequently emits a red fluorescence in the 630 nm range. This emission is detected by the SpectroPen, which graphs the characteristic peaks on a monitor, allowing the surgeon to determine the precise boundaries of the cancerous cells (a peak in the 630 nm range would indicate the presence of tumor cells that have accumulated protoporphyrin-ix). Thus, protoporphyrin-ix fluorescence is used as an intraoperative indicator of the location of tumor cells and their margins. Our studies show that SpectroPen can effectively be used to detect tumor cells with in-vitro cultures of glioblastoma cell lines once the cells are incubated with 5-ALA dye overnight. Moreover, the fluorescent peak of protoporphyrin-ix is seen for as little as ~1000 U87 vIII cells when using the device; thus SpectroPen is very sensitive to the fluorescent emission of a small number of cells and would therefore enable a surgeon to efficiently visualize and clean up tumor margins. We are currently performing in-vivo experiments in rodents and, in collaboration with neurosurgeon Dr. Costas Hadjipanayis, Phase III clinical trials with SpectroPen.

Conclusions: Neurostimulation in the form of SCS ad peripheral nerve or subcutaneous small nerve stimulation represent an effective treatment modality for intractable neuropathic pain patients from different pathologies.

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CSF PHOSPHORYLATED NEUROFILAMENT SUBUNIT NF-H (PNF-H) LEVELS ARE PREDICTOR OF OUTCOME IN SPINAL CORD INJURY

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Several studies showed that the phosphorylated form of the neurofilament subunit NF-H (pNF-H) are related to neuronal injuries and its detection provide information about the presence and degree of neuronal loss. Neurofilaments are three subunits, namely NF-L, NF-M and NF-H. The phosphorylated neurofilament subunit NF-H (pNF-H) is present into serum and CSF in significant amounts following neuronal injury and may be detected. The pNF-H can be a biomarker of the neuronal injuries and its detection allows the monitoring neuronal pathology and may provide diagnosis and prognosis in humans. We are interested in pNF-H as biomarker of neuronal injury in spinal cord injury and we used a pNF-H ELISA test capable of detecting the levels of phosphorylated NF-H (pNF-H) to patients with spinal cord injury. We studied the pNF-H levels in CSF in two patients with spinal cord injury (SCI) and for normal values of pNF-H we determined the CSF pNF-H level from individuals without neurological damage. The pNF-H values of CSF from the two patients with SCI were 5–10 times higher than the normal and its higher values were related to an unfavorable outcome. In conclusion, although the number of cases is very low – only two, in the context of experimental studies in animals with SCI, we can say that pNF-H is marker in SCI in humans and its increased values are consistent with an unfavorable outcome.

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DIAGNOSIS AND TREATMENT OF NORMAL PRESSURE HYDROCEPHALUS IN ELDERLY PATIENTS

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Normal pressure hydrocephalus (NPH) is a very controversial diagnosis. Patients often present neuropsychiatric symptoms besides the classic triad associating: dementia, gait impairment and urinary incontinence. Diagnosis is complicated by the fact, that an important rate of NPH patients are also suffering from another neuro degenerative pathology In this presentation we review all the clinical symptoms to confirm the diagnosis of NPH, including the most important differential diagnosis. We are reporting the interest and the importance of radiological findings and also the reability of CSF lumbar evacuation. This test is particularly interesting for the diagnosis, and also to try to evaluate the result after surgery. We also present the results of a series of 180 elderly patients treated by programmable CSF derivation since 2000. All patients have been controlled, clinically, radiologicaly. Clinical evolution is discussed as the criteria of surgical indication, with a special interest in the choice of a programmable derivation, which allows to adapt the flow of CSF, and decrease the rate of iatrogenic complication.

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NOVEL TRAINING COURSE OF NEURORESUSCITATION FOR NEUROSURGEON IN JAPAN: PRIMARY NEUROSURGICAL LIFE SUPPORT COURSE

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Background and Aims: In neurological emergencies, effective and reliable relationship between emergency room (ER) staff and neurosurgeons is important. Immediate Stroke Life Support (ISLS) Course was developed to instruct ER staff in basic neuroresuscitation by Japan Association of Acute Medicine (JAAM) and Japanese Congress on Neurological Emergencies (JNE) in 2006 and has spread in Japanese ER staff. And this course also has been introduced to Japanese neurologists. Japan Resuscitation Council (JRC) published the first guideline for neuroresuscitation, as a part of the original guidelines for resuscitation in 2010 (Okudera, Sakamoto reported at ICNE2012). In these situations, a novel training course for neurosurgeons should be introduced to build more effective cooperation with ER staff in neurological emergencies. Therefore, we developed a training course for neurosurgeons called 'The Primary Neurosurgical Life Support (PNLS) Course' based on the ISLS. We have conducted this course in Japan as well as in several foreign countries, especially in Asian countries. We here report the details of this course and our activities.

Methods: The PNLS was designed to practice the assessment and management of neurosurgical emergency diseases, besides basic neuroresuscitation methods. The PNLS is a half day course and consists of 4 modules: Module A, evaluation of consciousness levels; Module B, evaluation of neurological conditions; Module C, management of cerebral herniation using simulated patients; and Module D, group work study of neuroresuscitation using clinical maps, developed as a tool for case simulation on the desk. This course was supported by the JRC neuroresuscitation guideline in 2010.

Results: Since 2009, we have conducted 14 PNLS Courses in Japan and 4 International PNLS Courses in four cities: Nagoya (Japan), Kuala Lumpur (Malaysia), Kathmandu (Nepal), and Istanbul (Turkey). We also conducted this course in Ulaanbaatar (Mongolia) in 2011 and Addis Ababa (Ethiopia) in 2012 as parts of the World Federation on Neurosurgical Societies (WFNS) educational courses. The results of questionnaires given to the

attendees showed that most thought that this course was very useful.

Conclusions: The PNLS is a useful training course for neurosurgeons in neurological emergency. We have provided the standard skills of neuroresuscitation for neurosurgeons through this training course in the world, especially in Asian countries.

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NEURO-STIMULATION IN THE MANAGEMENT OF NEUROPATHIC PAIN

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Objectives: To demonstrate the effectiveness of neurostimulation in the treatment of intractable neuropathic pain. Spinal Cord Stimulation (SCS) is a well-documented technique in the treatment of neuropathic pain; associated to FBSS, Complex Regional Pain Syndrome (CRPS), post herpetic neuralgia, peripheral nerve lesions, peripheral vascular disease, refractory angina pectoris and many other indications including cervicogenic headache and migraine. The mechanism of effectiveness of SCS is based (even not completely) on the Gate Control Theory with stimulation of the large afferent fibers of the dorsal columns which will increase the central inhibition on the nociceptive fibers, this effects require the integrity of sufficient number of the dorsal large leminiscal fibers which could be verified by SSEP.

Materials and Methods: A strict patient selection is essential before proceeding with Neurostimulation, clinical assessment is important to know the underlying cause of pain with the topography of the lesion, radiological studies will document or rule out a treatable cause, neurophysiological study to document the lesion level and type, but of utmost importance a socio-economic and psychological clearance needs to be done before any surgical decision. The technique of spinal cord stimulation starts with a trial for few days. If the trial test is positive, the permanent generator is implanted the patients can use him their own programmer for fine adjustment. In Neuro Spinal Hospital, 32 patients received neurostimulation devices age varies from 21 to 75 years (average age: 51 years), 18 patients had FBSS, the rest are 4 patients with incomplete spinal cord injury, 4 patients with cauda equina injury, 3 patient for CRPS and one for peripheral vascular disease. 1 patient with post-herpetic neuralgia, received subcutaneous peripheral nerve stimulation and 1 for CRPS in the foot received proneal nerve stimulation, followed by SPNS and one patient had chronic thoracic pain post traumatic received subcutaneous PNS.

Results: In our FBSS patients all of them except two experienced more than 70% pain improvement, the two patients who were unhappy with the SCS, in addition to one patient (not included in these patients) who had his SCS done somewhere else for S1 nerve root injury after L5-S1 discectomy. All 3 patients had their SCS removed. The improvement was stable in the rest of patients over an age of 2 years. 2 patients needed additional intrathecal morphine therapy for severe nociceptive associated pain. The literature showed more than 50% pain improvement in about 75% of patients treated for FBSS with the SCS technique, in CRPN the response is about 80% to 90% with peripheral nerve stimulator and for headache in about 88% if treated with occipital nerve stimulator and for the chronic critical limb ischemic syndrome can cover at least 50% of the pain and can improve the circulation to the capillaries.

Conclusions: Neurostimulation in the form of SCS ad peripheral nerve or subcutaneous small nerve stimulation represent an effective treatment modality for intractable neuropathic pain patients from different pathologies.

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VIDEOENDOSCOPIC TRANSPEDICULAR CORD DECOMPRESSION IN COMPLICATED THORACO-LUMBAR SPINE TRAUMA

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Objectives: Surgical management of thoraco-lumbar spine traumapathology complicated by ventral cord compression is still disputable and technically demanding. Numerous surgical approaches currently used for the cord decompression can be categorized as posterolateral, lateral extracavitary and anterolateral. This paper presents out results in the surgical management of thoraco-lumbar spine trauma complicated by ventral cord compression utilizing modified transpedicular approach. In order to excel our clinical results, we supplemented this technique with video endoscopy.

Methods: The entire study sample included 52 patients operated on between 2001 and 2013, ages 23–66 (mean 37). All patients initially presented with weakness in the lower limbs and (or) pelvic organ dysfunction. Neuroimaging studies included plain x-ray in all 52 patients, supplemented with positive myelography in 12 patients, computerized tomography (CT) in 27 and magnetic resonance imaging (MRI) in 18 patients. Initially 12 (23.5%) presented with grade A, 20 (37.5%) patients with grade B, 14 (26.5%) with grade C, 6 (12.5%) with grade D, and none with grade E. Neurologic outcome was graded by the Frankel scale on a follow up examinations held 1, 6, 12 and 18–24 months postoperatively. Operations was performed under general anesthesia. The patient is placed in the prone position. A 4 cm long skin incision is made along spinal processes adjacent to the corresponding disc. A subperiosteal dissection is used to free the paraspinal muscles. With a high speed drill the lateral portion of the facet complex and rostral half of the pedicle are removed, exposing lateral margin of the thecal sac and the nerve root lying rostral to the disc. The cavity created by the resection of the vertebral body is limited by the thin, bony shell of the posterior cortex. The epidural sequestrated fragments attached to the shell are dislodged anteriorly in to the cavity, off the thecal sac, and removed under control of video endoscopy. Once the thecal sac and nerve root are decompressed, hemostasis is obtained with tamponade and bipolar electrocautery. The final stage of the

operation is pedicular screw fixation. The operative wound is closed in layers.

Results: Analysis of preoperative and final follow-up (18–24 months postoperatively) Frankel grades showed improvement to grade E in 23 (41.5%), reached grade D in 10 (20.5%), reached grade C in (15%), reached grade B in 5 (11%). Six patients (12%) remained paraplegic. None of the patients referred with orthopedic complains. Incomplete decompression or residual compressive substrate within the spinal channel was identified in 4 (9.5%) patients, subsequently requiring decompression via transthoracic approach.

Conclusions: Video-assisted transpedicular approach allows adequate exposure of the ventral aspect of the spinal channel. The proposed technique may be a valuable option in the management traumatic thoraco-lumbar spine pathology complicated by ventral cord compression.

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MICROSURGERY FOR DEGENERATIVE THORACIC SPINE DISEASE: COMPARATIVE ANALYSIS WITH CONVENTIONAL SURGICAL TECHNIQUES

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Objectives: Surgical management of symptomatic thoracic disc herniation (TDH) has historically been problematic and technically demanding. Selection of the surgical method for the management of TDH remains controversial and widely disputable, mostly because there are few clinical studies in which two or more approaches was conducted. This paper gives an analysis of 27 year experience in the surgical management of TDH, utilizing laminectomy (LE), costotransversectomy (CTE), arthropediculectomy (APE) and extrapleural thoracotomy (EPT).

Methods: The entire study sample included 76 patients operated on between 1981 and 2003. During 1981 to 2001, 42 patients (control group) were operated on with LE (31 case) and CTE (11 cases). Thirty four (34) patients (experimental group) operated on between 2001 and 2013 underwent EPT (24 cases) or APE (10 cases), both with aid of video endoscopic technique at the stage of cord decompression. Neurologic outcome was graded by the Frankel scale on a follow up examinations held 1, 6, 12 and 16–20 months postoperatively. In our series APE was recommended for patients with lateral TDH, and for selected calcified mediolateral TDHs. EPT was utilized for heavily or partially calcified medial and (or) mediolateral TDHs. Patients with localized thoracic pain or radiculopathy were treated conservatively. Surgery via APE was recommended for those with severe and refractory to treatment radiculopathy. Mild myelopathy was managed conservatively if it was not progressive or associated with functional impairment. Progression of the myelopathy served as indication for surgery.

Results: Frankel grades showed significant difference in the functional outcomes of patients after different surgical approaches. Of the 24 patients after EPT, the Frankel grade improved to E in 21 (86%), reached grade D in 3 (14%) and worsened in 0%. Results of APE showed improvement to grade E in all 9 (100%) patients. Seven (70%) patients operated via CTE improved to grade E, 3 (30%) patients improved to lesser degree. Outcomes after LE were not favorable: seven (22.4%) patients improved to grade E, 11 (35.2%) patients improved to lesser degree, 3 (9.6%) stabilized, 7 (22%) worsened. The total approach associated morbidity in our series averaged 10% for APE, 32.8% for EPT, 36% for CTE and 48% for LE ($p > 0.05$).

Conclusions: Video-assisted EPT allow excellent exposure of the medial and mediolateral TDHs and is also the best choice for calcified TDH in association with osteophytes. Endoscopic APE is best suited for lateral, soft TDH or for medically compromised patients. Both techniques cause minimal destabilization of the spinal segment and do not require fusion. Costotransversectomy provides more lateral access to TDH but entails large osteoligamentous resection and blood loss, leading to high morbidity and orthopaedic complications. The value of laminectomy in the surgery of TDH is questionable due to high rate of neurological and orthopaedic complications.

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RISK FACTORS OF HEMORRHAGIC TRANSFORMATION IN PATIENTS RECEIVING INTRA-ARTERIAL THROMBOLYSIS THERAPY

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Objectives: To investigate the independent clinical predictors of HT using laboratory data from patients receiving intra-arterial thrombolysis therapy.

Methods: We performed a retrospective study to investigate the characteristics of patients with or without HT who were receiving intra-arterial thrombolysis therapy, including biochemical analysis, renal function test, routine blood test, blood lipid test, coagulation blood test, liver function test, random blood glucose test, the time window for intra-arterial thrombolysis, recanalization, NIHSS score and systolic blood pressure before intra-arterial thrombolysis.

Results: The mortality rates were similar between the HT and non-HT groups ($p = 0.944$). In the single-factor analysis, patients with a higher globulin level ($p < 0.002$), prothrombin time activity percentage (PTA; $p = 0.026$) and National Institutes of Health Stroke Scale (NIHSS) score ($p = 0.002$), had significantly increased risk of developing HT. In the multifactor logistic regression model, we included globulin level, PTA, white blood cell count and NIHSS score and found that globulin level ($p < 0.001$; OR, 1.185; 95% confidence interval [CI], 1.090–1.288), PTA ($p = 0.018$; OR, 1.016; 95% CI, 1.003–1.029), white blood cell count ($p = 0.025$; OR, 1.097; 95% CI, 1.012–1.190) and NIHSS score ($p = 0.003$; OR, 1.097; 95% CI, 1.031–1.166) were significantly increased in the HT group.

Conclusions: The increase in globulin level is an independent risk factor for HT in patients receiving intra-arterial thrombolysis,

with the possible mechanisms behind the increase involving inflammatory cytokines, matrix metalloproteinase 9, and positive acute-phase reactants synthesized by the liver.

Conclusion: EPO treatment within 4 hours after injury reduced astrogliosis, promoted neuritis outgrowth, and inhibited the transcription of pro-inflammatory cytokine. EPO treatment within the appropriate therapeutic time window might be useful tools for regeneration after SCI.

Session P6: Neurorehabilitation

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EFFECTS OF ERYTHROPOIETIN ON GLIAL SCAR FORMATION AND AXONAL OUTGROWTH IN A TRAUMATICALLY INJURED SPINAL CORD MODEL

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Objectives: To investigate the effectiveness, mechanism, and therapeutic time window of erythropoietin (EPO) in attenuating the glialscar formation.

Materials and Methods: Astrocyte cultures from spinal cord were obtained from postnatal day 6 Sprague-Dawley rat pups. Following incubation in trypsin solution, DMEM treatment containing 10% fetal bovine serum, and centrifugation, loosely adhering oligodendroglia and strongly adhering microglia were removed by shaking or using mM L-leucine-methylester. Cells were allowed to grow to near confluence in DMEM containing 20 mM glucose and 10% calf serum in a water saturated air with 5% CO2 at 37°C.

Following culture >3 weeks, 99% of the cells were GFAP (glial fibrillary acidic protein)-positive astrocytes were confirmed using immunocyto chemical staining. Scratch wound, using a standard 200 ul sterile plastic pipette tip and drawing three horizontal and three vertical lines, and treatment with kainate (KA) of 50 uM for 2 hours were provided. After those, EPO treatment at different concentrations (0, 100, or 300 U/ml) was provided 0, 2, 4, 8 hours and cultured for 48 hours. For evaluation of the neurite extension, spinal cord neurons from E-16 Sprague-Dawley rat embryos were plated onto the astrocyte cultures at the density 2 × 105 cells immediately after injury and were treated with EPO (100 U/ml) at 0, 2, 4, 8 and 12 hours after injury. Some cultures were treated with anti-rhEPO receptor antibody. Confocally microscopic exam and immune-histochemical analyses were performed.

Results: EPO treatment 0, 2, 4 hours reduced the expression of GFAP, vimentin, CSPG, phosphacan, ROCK, EphA4, tumor necrosis factor-a, transforming growth factor-b, and p-Smad3 ($p < 0.001$) and promoted b-III tubulin-immunoreactive axons ($p < 0.001$).

EPO-enhanced b-III tubulin-immunoreactive axons was inhibited by anti-rhEPO receptor antibody ($p < 0.001$).

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AN ANALYSIS OF LENGTH OF STAY IN DIFFERENT NEUROLOGICAL DISORDERS PATIENTS IN SAUDI ARABIA

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Objectives: To determine and analyze the influence of age, gender and type of injury in the length of stay (LoS) of patients after stroke, spinal cord injury and brain injury.

Methods: We conducted a retrospective study of all patients (n = 2,024, age between 11–80) who completed the stroke (n = 823; male 551, female 272), traumatic spinal cord injury (TSCI) (n = 495; male 404, female 91), non-traumatic spinal cord injury (NTSCI) (n = 126; male 81, female 45) and traumatic brain injury (TBI) (n = 475, male 410, female 65) and non-traumatic brain injury (NTBI) (n = 105, male 61, female 44) rehabilitation program at Sultan Bin Abdulaziz Humanitarian City, Riyadh, Saudi Arabia from January 2007 to October 2009 were included in this study. The patients were divided into 7 groups based on their age, 11–20, 21–30, 31–40, 41–50, 51–60, and 61–70 years. Patient's aged ≤10 and ≥81 years were excluded due to the small proportion.

Results: The frequency of stroke was higher in >50 years age groups, and lower in the <30 years age group. The LoS of males were longer than females in all age groups, and statistically significant results were observed in the 51–60 ($p = 0.0084$), 61–70 ($p = 0.0042$), and 71–80 ($p = 0.037$) age groups as compared to females. The frequency of the TSCI was higher in the 21–30 age group and lower in the 71–80 age group. Compared to TSCI, patients with NTSCI had a significantly ($p = 0.035$) shorter LoS (58.8 ± 1.68, 46.2 ± 2.1). The LoS of male was longer than the female in all age groups. The frequency of TBI was higher in the 11–20 and 21–30 age groups, and lower in 61–70 age group. The frequency of NTBI was higher in the 21–30 and lower in 61–70 age group. Compared to TBI, the frequency of NTBI was less in all age groups. The LoS of TBI and NTBI increases with age up to the 51–60 age group. However, a minor decrease was observed in 61–70 age group compared to the 51–60 age group. The findings also showed that when compared to TBI, patients with NTBI had a significantly ($p = 0.0027$) shorter rehabilitation LoS (58.2 ± 2.6, 43.5 ± 2.9).

Conclusion: Male had higher frequency of stroke, TSCI, NTSCI, TBI and NTBI in all age groups compared to their counterpart. Male had higher LoS in all age groups of stroke, TSCI, NTSCI, TBI and NTBI rehabilitation program compared to their counterpart. Compared to NTBI (43.5 days), the TSCI (58.8 days) had higher LoS followed by TBI (58.2 days), NTSCI (46.2 days) and stroke (45 days).

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RELIABILITY AND RESPONSIVENESS OF THE GREEK VERSION OF THE STROKE-SPECIFIC QUALITY OF LIFE QUESTIONNAIRE (SSQOL-GR): A PILOT STUDY

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Objectives: The purpose of this study was to test the reliability and to pilot the responsiveness of the Greek version of Stroke-Specific Quality of Life Questionnaire (SSQOL-GR) in patients with stroke in Greece.

Methods: A sample of 18 patients with stroke (9 males, 9 females) aged 43–83 years old (Mean: 66.39, SD: 12.3) was included for the reliability study. The time since initial stroke ranged from one month to 10 years. 14 patients had ischemic stroke and 4 patients hemorrhagic stroke. Subjects were requested to complete the SSQOL-GR questionnaire in two occasions with 7–15 days apart. For the responsiveness pilot study a further sample of 10 patients with stroke (5 males, 5 females) aged 59.8 (39 to 82 years old) with the same ratio of ischemic/hemorrhagic stroke were included. The time since initial stroke ranged from one month to 5 months and all patients received treatment in a rehabilitation centre including physiotherapy, speech therapy, occupational therapy and psychological support for an average of three months (2–4 months). The patients completed the SSQOL-GR and three other questionnaires already adapted into Greek, the Barthel Index (BI), the SF-36v2 and the Beck Depression Inventory (BDI). Questionnaires were personally administered and completed via structured interviews. Domain responsiveness was assessed in patients affected in that domain by completing the questionnaires twice at the beginning of their treatment and at their discharge from the centre (mean treatment time: 3 months). For the statistical analysis Spearman r, Wilkoxon rank test, Cronbach a, evaluation of floor and ceiling values in proportion of minimum and maximum scores were all used for the reliability study. Domain responsiveness to change was estimated in patients reporting dysfunction in that domain with the use of standardized effect sizes (SES) and the standardized response means (SRM). Spearman r2 and t-test were also used for the responsiveness study by using the Statistical Package for the Social Sciences (SPSS, version 20.0).

Results: Test–retest of SS-QOL-GR showed moderate to excellent stability for the different domains, Spearman's r = 0.46–0.97. Internal consistency for all domains showed Cronbach's a = 0.55–0.96. Missing items rate was 1.0%. Most of the SSQOL-GR domains demonstrated moderately responsiveness, with SES and SRM scores >0.5. SES and SRM scores for the BDI, BI and SF-36 were >0.8 showing strong responsiveness. The language, vision and personality domains of SSQOL-GR were noticeably less responsive.

Conclusions: The Greek version of the SSQOL questionnaire has proven to be reliable and sensitive in changes when it is applied in patient with stroke.

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POSTOPERATIVE REHABILITATION IN PATIENTS WITH DISCOGENIC THORACIC MYELOPATHY

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Introduction: Discogenic thoracic myelopathy requires immediate surgical attention to prevent permanent neurologic compromise. Based on our data, 80% of patients had alleviation of pain with surgery, 85% had improvement in hyperreflexia, and 82% had improvement in urinary symptoms. However, clinical outcomes after thoracic disc surgery are not as good as after cervical or lumbar disc surgery, and 8–12% of patients undergoing surgical procedures for thoracic disc problems experienced no relief of symptoms. Purpose: introduce the methodology of postoperative rehabilitation in patients with discogenic thoracic myelopathy.

Material and Methods: The primary focus of rehabilitation in patients in patients with discogenic thoracic myelopathy was to restore function in activities of daily living and to teach patients how to manage their symptoms. Rehabilitation process started with assessment of the degree of involvement of the CNS, including signs of upper motor neuron involvement, sensory/motor changes, signs of bowel and bladder dysfunction. While managing pain, patients exercised the trunk and other involved extremities. Exercises may be initiated when indicated and progressed as tolerated. Postural training was followed by strengthening, balance, and stabilization exercises. In lower extremity impairment, gait training, stretching, and strengthening exercises were indicated. Besides supervised rehabilitation, the patients was instructed in a independent home exercise program, after the completion of rehabilitation.

Results: Proposed methodology of postoperative rehabilitation showed to be effective in all cases.

Conclusion: Postoperative rehabilitation in patients with discogenic thoracic myelopathy should be initiated immediately after surgery in a structured, goal-oriented manner.

Session P7: Neuroimaging Studies

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DEFINITION OF A STEREOTACTIC 3D MODEL OF THE HUMAN INSULA FOR NEUROSURGICAL APPROACH (EPILEPSY AND STEREOTAXIC SURGERY)

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Introduction: Design a method for 3D reconstruction of the insula, including its gyri and sulci, in AC-PC reference usable individually for imaging or for epilepsy and stereotactic surgery.

Material and Method: Morphometric study using 56 MRI of normal insular region.26 male/30 female, 28 left/28 right hemispheres. Stage 1: Reconstruction in AC-PC reference of the insula from 3D-T1-MRI slices 1 mm thick. Stage 2: Digitalization and superposition of data in 3D using PhotoStudio software (Photo Editing Software) system with PC as the center of coordinates. Stage 3: MATLAB software (Mathworks Inc.) was used to transform in color values each pixel to obtain a color scale corresponding to the probability of insula sulci localization between 0% and 100%.

Results: Demonstration of very significant correlations between the coordinates of the main insular structures (angles, sulci.) and the length of AC-PC. This close correlation allows describing a method for 3D reconstruction of the insula on MRI slices that requires only the positions of Ac and PC and then the inter-commissural (AC-PC) length. This procedure defines an area containing insula with 100% probability.

Conclusions: 3D reconstruction of insula will be potentially useful for: 1) To improve localization of cortical areas, allowing differentiating insular cortex from opercular cortex during stereo-electroencephalographic exploration of patients with epilepsy (SEEG) or in morphological and functional imaging. 2) For microsurgical approach of Insula using Neuronavigation techniques. 3) Identification of Insula during stereotactic surgery (SEEG, biopsy).

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PREVALENCE OF UNRUPTURED ANEURYSM IN PATIENTS WITH MIGRAINE

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Objective: Incidental aneurysm is asymptomatic but occasionally causes subarchnoid hemorrhage. Unruptured aneurysms can be detected in primary headache. However, its incidence or characteristics are not well known. Purpose of present study was to screen the aneurysm by a magnetic resonance angiography (MRA) in migraineurs. We described the features comparing to the non-aneurysmal subjects, and previous reports.

Methods: A consecutive 1,773 patients were screen for aneurysm by MRA. When the aneurysm was unclear by MRA, further evaluation with transfemoral cerebral angiography (TFCA), or three dimentional computerized tomography (CT) angio were performed. For each aneurismal evaluation, size in mm, number (single or multi), shape (saccular or fusiform), and locations were recorded. All subjects were interviewed and completed self-reported questionnaire contains questions on the diversity of headache quality, severity, location, frequency, onset, duration, familial and environmental factors, associated symptoms and headache-related disabilities. They were grouped into unruptured aneurysms and migraineurs without aneurysm, and compared.

Results: Unruptured indicental aneurysms were detected in 3.6% (63/1,773) of patients with mean age of 56.0 years. The gender difference showed higher proportion in woman (87.3%). Mean size of aneurysm was 3.5 mm. Location was internal carotid artery (48.7%), middle cerebral artery (19.7%), posterior communicating artery (11.8%), Anterior communicating artery (11.8%) and basilar artery (3.9%) in order. Questionnaire showed difference in 'pain location' ($p = 0.025$), 'double vision' ($p = 0.026$), 'aggravation by hormone therapy' ($p = 0.039$) and 'had a migraine in younger age' ($p = 0.021$).

Conclusions: Unruptured aneurysm in migraineurs follows the age-group of aneurysmal study rather than those of migraineurs. They are identified as an initial stage of unruptured aneurysm. Different clinical points warrant further study to be a predictive value to screen the incidental aneurysm in migraineurs.

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CORPUS CALLOSUM CHANGES PREDICT PATHOLOGY PROGRESSION IN ALZHEIMER'S DISEASE

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Objectives: Alzheimer's disease (AD) is a neurodegenerative disorder characterized by progressive and irreversible decline of cognitive functions and the development of neuropsychiatric symptoms (NPS) (Spalletta et al., 2010). The corpus callosum (CC) is altered in early stage of AD (Di Paola et al., 2010a, 2010b). Can these callosal modifications, appearing early in the illness's course, predict the AD's cognitive and neuropsychiatric symptoms evolution at 1 year?

Materials: Sixty patients at their first diagnosis were assessed at baseline with imaging acquisition, neuropsychological and neurobehavioral examination. At year one, a subgroup of 20 patients underwent a neuropsychological and neurobehavioral re-assessment.

Methods: Combining different quantitative MRI techniques: Thickness Analyses and Diffusion Tensor Imaging, we aimed at identifying specific subregions of callosal white matter (WM) which predict one year dementia progression, cognitive and neurobehavioral dysfunction in patients with mild AD.

Results: For the cognitive domain we found that structural integrity at level of isthmus/splenium is related to MMSE. For the neurobehavioral aspect, we found that altered structure of the genu is related with depression.

Discussion: The correlation between the posterior callosal subregion (isthmus/splenium) and the MMSE, which is an indicator of the pathology's progression and severity, is in agreement with our previous article on different group of AD patients. At that time we concluded that the correlation between the MMSE and the isthmus of the CC area measurements may serve as an in vivo indicator of the progress of neocortical disintegration in AD. The posterior callosal subregion (isthmus/splenium), interconnect homotopic temporal and parietal cortices. There is considerable evidence from literature that bilateral temporo-parietal cortices are implicated in performing memory, attention and motor planning tasks many of which are required to perform the MMSE too. We found that the depression is related with changes at level of rostrum. The rostrum connects the orbitofrontal cortices, which are also involved in mood regulation.

Conclusions: Our findings highlight the importance of changes to the interhemispheric callosal pathways in predicting cognitive and behavioural symptoms' evolution in mild AD. Abnormalities in these pathways, which interconnect cognitive and behavioural networks between the two hemispheres, may result in an altered structural and eventually functional connectivity between cortices that contributes to short-term cognitive and behavioural disability.

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SELECTIVE COGNITIVE DYSFUNCTION IN TBI PATIENTS IS RELATED TO A SELECTIVE CEREBRAL DAMAGE'S PATTERN

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Objectives: Cognitive dysfunction is a common sequelae of Traumatic Brain Injury (TBI). However TBI patients show a heterogeneous pattern of cognitive deficits, after the traumatic episode. This study was aimed at investigating whether patients who developed selective cognitive dysfunction after TBI, present a selective pattern of cerebral damage. In particular, we were interested in evaluating whether TBI patient with episodic memory disorder and TBI patients with executive function impairment had different brain modifications.

Materials: Between January 2009 and January 2011, 185 patients with severe TBI consecutively were consecutively admitted to the Post-Coma Unit of the IRCCS Santa Lucia Foundation in Rome, of these 120 were in-patients and 65 were out-patients. Out of the initial 185 patients, we selected eight TBI patients with selective episodic memory impairment defined as patients with poor performances in the conscious experience of recollection; and seven TBI patients with selective executive impairment defined as patients with poor performances in working memory, inhibition, and planning. Methods. We employed two complementary analyses: 1) an exploratory and qualitative approach in which we explored the distributions of lesions between groups, and 2) a hypothesis-driven and quantitative approach in which we calculated the volume of hippocampi in both TBI groups and control group.

Results: We found that TBI patients with executive function impairment presented a main brain damage at level of frontal lobe, and TBI patient with episodic memory disorder instead showed a main involvement of mesial temporal structure (hippocampus). Discussion. These data are in perfect agreement with literature which related poor performance on verbal memory tasks to reductions in integrity of the hippocampus and the pathway related to it (Di Paola et al., 2008; Di Paola et al., 2010); and which related the TBI patients resulting in 'executive dysfunction' to frontal cortex damage (Stuss, 2012). Additionally a correlational analysis showed a positive correlation between the scores on episodic memory tests and the volume of the left hippocampi.

Conclusions: What it interesting here is the potential of this approach: the study of TBI patients with selective cognitive dysfunction allow to work on simpler TBI condition, allow to follow more selectively long-term outcome scenarios, and to plan more focused rehabilitation programs whose achievements or failures are easier to individuate. Knowing what happens in less

variable conditions can be of help in disentangle the complexity and in plan more more targeted actions in daily clinical activity (such as the rehabilitation program), where complexity of TBI condition may mislead.

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TESTOSTERONE TREATMENT INCREASES CEREBRAL GRAY MATTER IN MULTIPLE SCLEROSIS

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Introduction: Multiple sclerosis is associated with inflammation and neurodegeneration. White matter lesions are commonly used as biomarkers in multiple sclerosis, not only to assess disease severity but also to measure anti-inflammatory treatment success. Less attention has been devoted to gray matter, which seems a bit surprising because gray matter atrophy progresses, at least partly, independent of new white matter lesions. Gray matter atrophy also correlates better with clinical disability than lesions do. Thus, while current treatment strategies in multiple sclerosis primarily aim to prevent inflammation and white matter lesions, treatment aimed at gray matter and neuroprotection may provide a complementary strategy. This pilot clinical trial was designed to assess the neuroprotective potential of testosterone in the framework of multiple sclerosis.

Methods: The sample consisted of 10 men with multiple sclerosis. All subjects were first observed without treatment for 6 months (observation phase). This was followed by a 12-month period of treatment with testosterone. For analysis, these 12 months were divided into a 6-month wash-in period (transition phase) and a subsequent 6-month period when full treatment efficacy was expected (protection phase). High-resolution T1-weighted brain scans were acquired at month 0, 6, 12, and 18. Phase-specific changes in local gray matter were examined at thousands of voxels across the entire brain. To account for the multiple statistical comparisons, the significance level was appropriately adjusted by controlling the family-wise error rate at $p < 0.05$.

Results: During the observation phase (month 0 – month 6), significant gray matter decrease was widespread throughout the entire brain ($p < 0.05$, corrected for multiple comparisons). During the transition phase (month 6 – month 12), the extent of significant gray matter loss was considerably diminished. During the protection phase (month 12 – month 18), significant gray matter decrease was no longer evident. Instead, significant gray matter increase occurred in the right middle frontal gyrus (p≤0.05, corrected for multiple comparisons). Note, testosterone treatment had no significant effect on overall lesion volume or the number of newly occurring lesions, thereby indicating that observed gray matter changes are not driven by potential lesion changes.

Conclusions: To our knowledge, this is the first report of a testosterone-induced gray matter increase in multiple sclerosis. The observed effectsmay indicate the potential of testosterone to stall (perhaps even reverse) neurodegeneration as associated with multiple sclerosis.

While current treatment strategies in multiple sclerosis primarily aim to prevent inflammation and white matter lesions, treatment with testosterone may provide a complementary intervention strategy aimed at neuroprotection and the preservation (perhaps even restoration) of gray matter. The present results may also encourage the further study of testosterone in other neurodegenerative diseases (e.g., Alzheimer's and Huntington's disease) or spinal cord injuries, where testosterone is being considered as treatment option.

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UP, UP, AND AWAY: A JOUNREY THROUGH THE SKULL BASE

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Objectives and Background: The skull base foramina act as vital conduits between the extracranial spaces and the intracranial cavity and can serve as a gateway of disease spread into multiple compartments. The anatomy of the skull base foramina as well as its traversing nerves and vessels is complex, and meticulous anatomic evaluation of this region is frequently necessary. High-resolution MRI sequences as well as CT play a decisive role in reaching a diagnosis and directing patient management. MRI has excellent spatial and temporal resolution which significantly improves its diagnostic sensitivity; whereas, CT provides unparalleled detail of the osseous structures. It is important for the physician to be familiar with imaging anatomy to make accurate and complete diagnoses.

The objectives of this study are the following:

1. To illustrate the cross sectional anatomy of the skull base foramina with a description of its normal contents.

2. To present commonly encountered pathologies with an emphasis on surgical relevance.

Methods and Key Imaging Findings: Through a thorough pictoral review, key MRI and CT anatomic findings will be highlighted in a systematic fashion including the cribriform plate and foramen cecum of the anterior cranial fossa; the foramen rotundum, foramen ovale, foramen spinosum, foramen lacerum, vidian canal, vesalius foramen, and palatovaginal canal of the middle cranial fossa; and the jugular foramen, hypoglossal canal, and persistent craniopharyngeal canal of the posterior cranial fossa. Focus will then be placed on common pathologies, such as

perineural spread of neoplasm, nerve sheath tumors, meningiomas, paragangliomas, and vascular lesions as well as surgical approaches involving these foramina.

Conclusion: Knowledge and accurate recognition of skull base foraminal imaging anatomy and review of common pathologies can help physicians increase their diagnostic acumen, aid in treatment planning, and significantly impact overall patient care.

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IRON CONTENT IN THE CORTICAL SPINAL TRACT IN HUNTINGTON'S DISEASE

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Introduction: The progressive motor impairment is critical in Huntington's disease (HD) and subtly develops since before clearly manifest symptoms appear. For instance, the integrity of white matter connections between primary motor cortex and spinal cord, the cortical spinal tract (CST), which is involved in motor function, merits particular attention Objectives Higher iron concentration in subcortical gray matter structures is documented in HD. Here we wanted to investigate the iron content in the cortical spinal tract in HD, using Transverse Relations Rate (R2*), which is an iron sensitive imaging.

Methods: Subjects groups included 25 HD patients, 25 presymptomatic HD (PreHD) subjects, 40 healthy controls. Six consecutive T2*-weighted gradient echo-planar whole-brain volumes were acquired at different time of echo (TE) (TEs: 6, 12, 20, 30, 45 and 60 ms; TR = 5000; bandwidth = 1116 Hz/vx; matrix size 128 x 128 x 80; flip angle 90°; voxel size of 1.5 x 1.5 x 2 mm3). A mono-exponential signal decay curve was obtained and we calculated i.e. relaxation rates R2*=1/T2*. A general linear model was used to test for differences between groups with sex and age included as covariates.

Results: An examination of R2* differences reveled a significant increase in the left CST in preHD subjects when compared to HD patients, ($F(2,86)= 3.46$, $p = 013$). HD patients did not have higher levels of iron in both CST, compared to healthy controls.

Conclusion: Our results indicate a change in WM microstructure between the presymptomatic phase and disease onset revealed by an increase of R2* (iron) in CST of PreHD subjects. An increase of iron content is associated with remyelination and with a higher density of oligodendrocytes, the brain cells with the highest iron, attempting to repair myelin damage. Our results suggest a higher number of oligodendrocytes, than normal in PreHD subjects that is in line with previous reports.

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MRI DIFFERENTIAL DIAGNOSIS OF THE THORACIC DISC HERNIATION

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Introduction: Thoracic Disc Herniation (TDH) has been difficult to diagnose, utilizing both clinical and radiological methods. MRI has emerged as the study of choice for evaluation of TDH. However TDHs are often confused with a neoplasm, particularly if there is a history of primary malignancy.

Purpose: describe the peculiarities in the MRI differential diagnosis of the TDH with a neoplasm.

Material and Methods: the study evaluates the results of MRI examination in 34 patients with TDH. In 24 cases sagittal views provided information on alignment and herniation. Axial views defined the extent of compression of the spinal cord and nerve roots. On MRI, TDHs appeared as focal, asymmetric protrusions of disk material beyond the confines of the anulus. However in 10 cases TDH had intermediate signal intensity on T1-WI and low intensity on T2-WI, mimicking a tumor. In such cases intravenous injection of Gd-DTPA in a dosage of 0.1 mmol/kg body weight, enhanced the posterior longitudinal ligament and visualized the areas of contrast uptake in the epidural space above and below the TDH corresponding to dilated and congested epidural veins.

Results: contrast-enhanced MRI was most helpful in considering other lesions in the differential diagnosis including abscess, hematoma, and primary or metastatic neoplasms. Degenerative changes in TDH, including clustering of chondrocytes and neovascularization, may be severe resulting in a pseudoneoplastic appearance.

Conclusion: awareness of the radiological and pathological features of TDH along with contrast-enhanced MRI scans are useful to differentiate it from a disc space infection or tumor.

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SOMATOSENSORY EVOKED POTENTIAL ABNORMALITIES IN ANKYLOSING SPONDYLITIS: THEIR RELATION TO CLINICAL FINDINGS

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A somatosensory evoked potential (SSEP) abnormality was reported in patients with ankylosing spondylitis (AS). This study aimed to investigate SSEP abnormalities and its relation with clinical findings in AS patients. The study included 26 patients with AS and 17 age-matched health volunteers (Control for SSEP). Median nerve SSEP findings were normal in all AS cases. However, delayed latency and/or very low amplitude of tibial nerve SSEP was found in 20 (76.9%) AS patients. There were significant correlations between tibial SSEP latency and disease duration (R = 0.433 to 0.635). There was also an inverse correlation between tibial SSEP amplitude and disease duration (R = –0.429, p = 0.047). Serum estradiol level, hip total bone mineral density, BASFI score and Beck depression score were significantly lower in AS patients with SSEP abnormalities (37.3 ± 10.8 pg/ml, 0.916 ± 0.123 g/cm2, 35.0 ± 27.9, 12.8 ± 8.4, respectively) than in AS patients without SSEP abnormalities (53.7 ± 12.3 pg/ml, 1.103 ± 0.197 g/cm2, 64.8 ± 15.5, 24.8 ± 10.1, respectively). Significant inverse correlations between SSEP latencies and dehydroepiandrosterone sulphate were found (R = –0.400 to –0.713). There were also significant inverse correlation between SSEP latencies and DHEAS/estrogen index (R = –0.596 to –0.868), and between SSEP latencies and DHEAS/Progesterone index (R = –0.467 to –0.685). As a conclusion, this study indicates that tibial nerve SSEP abnormalities are common in patient with AS and there are significant correlations between clinical findings of AS and SSEP abnormalities.

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GENETIC AND ENVIRONMENTAL RISK FACTORS FOR NEURODEGENERATIVE DISEASES AMONG ARAB POPULATION

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Background: Epidemiological and genetic studies of dementia have rarely been reported in an Arab population.

Methods: All persons aged 60 years or older who were residents of the rural area of Wadi Ara were examined for identification of DAT, vascular dementia (VaD) and conversion from age related cognitive decline (ARCD) to DAT using DSM-IV criteria and a semi-structured questionnaire for collection of demographic and medical data. ApoE genotype was also determined. Total plasma homocysteine (tHcy) was determined using HPLC with fluorescence detection. Vitamins B_{12} and plasma folate were determined using a commercial radioisotope dilution kit assay (ICN).

Objective: We studied the genetic and environmental risk factors and prevalence, and incidence of dementia of the Alzheimer type (DAT) among the elderly in an Arab community in Israel.

Results: DAT was diagnosed in 20.5% of this population. Its prevalence increased steeply with age. Illiteracy was very common, and strongly associated with higher prevalence of DAT. The annual incidence of DAT among ARCD cases was 4.4%. Subjects with ARCD who developed DAT were older than ARCD subjects who did not develop dementia. Hypertension was significantly more common among converted patients than among nonconverted. Illiteracy was insignificantly more common among those who developed DAT than among those who remained ARCD. Vascular dementia (VaD) constitutes about 22% of the total dementia population. We also confirm the association between VaD, illiteracy and hypertension. Smoking did not represent a risk factor for VaD. The survival rates among the three groups (healthy subjects, ARCD and DAT) were 80.5%, 58.8% and 55.5% respectively. Homocysteine levels were significantly higher than found in studies in Cleveland. Plasma B_{12} and plasma folate levels did not differ significantly between DAT patients and controls after adjusting for year of birth.

Conclusions: Our findings suggest that the Wadi Ara population is unique because of high prevalence rates of dementia. We found old age, female gender and lack of education to be risk factors for the development of DAT. The ApoE4; allele is relatively uncommon in this population and it cannot explain the high DAT prevalence. We also confirm the association between VaD, illiteracy and hypertension and older age and hypertension are risk factors for the transformation of ARCD to DAT.

Session P9: Neuropharmacology

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EFFECT OF OCIMUM BASILICUM EXTRACT AGAINST PENTYLENETETRAZOLE-INDUCED SEIZURE IN MICE

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Epilepsy always noticed as a most important nerves disease. Notwithstanding using various drugs, still there are many patients resister to this drugs also all of these drugs have harmful effects. In traditional medicine, Ocimum basilicum used to treatment seizure and effects of anticonvulsant of this drug is reported. To access this anti-seizures drug with low imposition we survey effect of anticonvulsant drug of extract of Ocimum basilicum in seizure induced with pentylenetetrazole. Hydro-alcohol extract of Ocimum basilicum with physiologic serum and various dozes (50–100–250–300–350 mg/kg) of extract inject to mices via interperitoneal 65 minutes before injection of pentylenetetrazole. And survey factors onset time of showing seizure effects, number of showing seizure effects The percentage of dead. We select the slot time (15–30–50–60–65–80–120 minutes) To survey the relevant slot time between relevant injection doze and pentylenetetrazole. Results of using various dozes (50–100–250–300–350 mg/kg) shows that onset time of showing seizure effects, number of showing seizure effects and The percentage of dead at 250 mg/kg doze, 65 minutes before injection of pentylenetetrazole dependently ($p < 0.05$) sequencely increased, decreased and decreased. The results can be obtained at a dose of hydroalcoholic 250 mg/kg effective as medication in preventing seizures in animal models introduced.

Session P10: Neuropsychology

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WHOLE-BODY VIBRATION INDUCED REFLEX MUSCLE ACTIVITY LATENCY AND TONIC VIBRATION REFLEX

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Objective: Whole-Body Vibration (WBV) applies thrust force in opposite direction to gravity to body. This mechanical stimulation induces reflex muscular activity. Tonic vibration reflex (TVR) is most commonly cited mechanism to explain WBV-induced reflex muscular activity (WBV-IRMA), although there is no conclusive evidence that TVR occurs. Primary aim of this study is to determine latency of WBV-IRMA. Secondary aim is to investigate whether WBV-IRMA is explained with TVR.

Materials and Methods: Ten healthy young-adult men participated in this study. Participants stood upright with their knees locked during WBV. WBV at 25, 30, 35, 40, 45, 50 Hz were applied. Surface electrodes were placed on both M.soleus. To measure TVR latency, piezzo-electric accelerometer was placed on the achilles tendon and this achilles tendon was stimulated with spring based mechanical reflex hammer. Our pilot study was showed that motor unit potentials (MUP) occurred in a 1:1 response with vibration. After confirmation of this finding, WBV-IRMA latency was measured in the present study. To measure WBV-IRMA latency, piezzo-electric force sensor was placed between heel and WBV platform. Exact moment of initial strike of heel when thrust force expressed by WBV began to be transferred to body was determined. The time between moment of the initial strike and corresponding MUP was defined as 'WBV-IRMA latency'. Piezzo-electric stretch sensor was placed between knee and malleol to simulate muscle spindle.

Results: WBV-IRMA latency was 48.3 ± 1.0 ms, and did not change with vibration frequency. TVR latency was 34.6 ± 0.9 ms before WBV. TVR latency remained unchanged during WBV. Piezzo-electric stretch sensor showed that muscle spindle could be exposed to stretching twice in each vibration cycle. But, frequency spectrum analysis showed that frequency of WBV-induced MUP was equal to vibration frequency.

Conclusion: WBV-IRMA latency is 48.3 (46.3–50.3) milliseconds (with 95% confidence interval). Latencies measurements and muscle spindle simulation analysis showed that WBV-IRMA cannot be explained with TVR.

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COGNITIVE EFFECTS OF ANTI-EPILEPTIC DRUGS IN NIGERIANS WITH EPILEPSY

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Background: Epilepsy is particularly highly prevalent in developing African countries and has been associated with cognitive disturbances, but more importantly is the contribution of the anti-epileptic drugs (AEDs). This study aimed at comparing the effects of AEDs on the cognitive functions of Nigerian epileptic patients.

Methods: This is a prospective study of 55 consecutive patients with epilepsy, aged 14 years and above, over a two year period (October 2000 to October 2002), recruited from the Neurology Clinic of the University Teaching Hospital, Benin City, Nigeria.

Anti-epileptic treatment with either carbamazepine (19 patients), phenytoin (18 patients), or phenobarbitone (18 patients) which was randomly assigned constituted the interventional measure. Cognitive testing, using the Iron Psychology (FePsy) a computerized neuro-psychological test battery, measured the visual and auditory reaction times, the continuous performance test and the recognition memory test to assess the mental speed, attention and memory respectively.

Results: The effect of the individual drug on cognitive performance revealed significant impairment of mental speed ($p < 0.001$) with the exemption of improved performance with phenytoin on auditory reaction time ($p > 0.05$). Carbamazepine did not significantly affect the verbal (Words section) memory scores ($p > 0.05$) implying better performance in tasks of verbal memory ($p < 0.05$). All the three anti-epileptic drugs strongly reduced the attention abilities of the patients ($p < 0.001$). Patients on phenobarbitone had the worst scores in both the verbal and non-verbal memory tasks.

Conclusion: The results of this study will be useful in the rationale selection of anti-epileptic drugs with the objective of minimizing, as much as possible, their cognitive side effects.

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USE OF TRANSCRANIAL DOPPLER IN THE ASSESSMENT OF CEREBROVASCULAR MODULATION IN ANXIETY

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Objectives: To study cerebrovascular modulation features in patients with chronic anxiety before and after treatment.

Methods: Subjects with Hamilton anxiety scale scores ≥ 14 were enrolled, and the dynamic changes in their cerebral blood flow velocity (CBFV) in response to an orthostatic challenge were investigated using transcranial Doppler. Next, we provided the patients with treatment, and then followed-up for a period of 6 months. Patients were divided into recovery group and non-recovery group after the end of followed-up and dynamic changes in their CBFV values were then re-recorded.

Results: The changes in CBFV values from the supine to the upright position differed between anxious and healthy subjects. Patients with anxiety showed more pronounced decreases in the CBFV values upon abrupt standing (10.40 ± 8.87 cm/s versus 3.20 ± 4.20 cm/s, $P < 0.01$). In the recovery group, the changes in the mean CBFV values from the supine to the upright position were significantly improved after treatment (10.17 ± 6.71 cm/s [before] vs. 3.97 ± 3.43 cm/s [after]; $P = 0.01$) and achieved a similar level of healthy subjects (3.97 ± 3.43 cm/s vs. 3.20 ± 4.20 cm/s; $P = 0.57$), however, the non-recovery group did not show improved changes (13.10 ± 10.98 cm/s [before] vs. 10.10 ± 6.15 cm/s [after]; $P = 0.26$).

Conclusions: The dynamic CBFV curve, an index of cerebrovascular modulation, was compromised in chronic anxiety, but can restore to normal after the disappearance of anxiety.

Session P11: Neuropsychiatrics

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THE RATE OF CONSANGUINEOUS MARRIAGES AMONG THE PARENTS OF SCHIZOPHRENIC PATIENTS IN THE ARAB BEDOUIN POPULATION IN SOUTHERN ISRAEL

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Objective: Consanguinity may contribute to the incidence of schizophrenia in offspring despite the usually accepted polygenic model of schizophrenia inheritance.

Method: Bedouin Arab families in southern Israel have a high rate of cousin marriages as do families throughout most Arab societies.

We studied consanguinity in the parents of schizophrenic patients admitted in a defined catchment area of southern Israel, compared to a control group of parents of all infants born to Bedouin mothers in this catchment area.

Results: There was a small but significant increase in the rate of cousin marriages among the parents of schizophrenia patients compared to parents of infant controls.

Conclusion: These results are consistent with claims that inbreeding can contribute to the incidence of schizophrenia even as a polygenic illness. However, the absence of a better matched control group limits confidence in the results.

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LEVODOPA THERAPY AND DEPRESSION IN PARKINSON'S DISEASE

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Aims: To assess prevalence of depression in patients with Parkinson's disease (PD) receiving levodopa (LD) therapy in comparison with those on other antiparkinsonian treatments.

Methods: Ninety-two patients aged 42–80 (mean age 64.8), 47 females (51%) participated in this study. Patients were diagnosed with PD according to UK Parkinson's Disease Society Brain Bank criteria. Disease duration was 0.5 –12 years (mean 5 years), Hoehn & Yahr (H&Y) stage 1–4 (mean 2.2). Patients were assessed using Unified Parkinson's Disease Rating Scale (UPDRS) domain III (motor examination) and Hamilton Depression Rating Scale (HAMD). Patients were divided into two groups – receiving LD treatment or without LD treatment (any other antiparkinsonian treatment). T-test was used for statistical analysis.

Results: Fifty-one patients (55.4%) were on LD treatment with mean LD daily dose 542 mg (100–1250 mg). In LD group mean H&Y stage was 2.4, mean UPDRS III score was 29. Thirty-three patients (64.7%) in LD group had depression with moderate and severe depression in 19 patients, comprising 37.2%. In non-LD group 30 patients (73.2%) were depressed with 17 (41.5%) having moderate and severe depression. T-test comparison of means of HAMD points between LD group (mean 15.3) and non-LD group (mean 18.5) showed statistically significant difference ($p < 0.05$).

Conclusion: Depression is very prevalent in patients with PD. According to our data, treatment with LD was associated with lower incidence of clinically significant depression, despite LD treated patients in had slightly worse motor function and more severe disease. This could be explained by positive influence of dopamine replacement in patients with PD.

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EXCESSIVE DAY TIME SLEEPINESS IN OBESE PATIENTS; A CASE-CONTROL STUDY

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The prevalence of obesity is increasing in this century. Obesity can change the normal pattern of sleep, so it has a negative impact on health. Unfortunately, obese patients have disorganized sleeps and they suffer from sleep disorders that result in learning and memory problems. Previous studies have shown that obese patients are more likely to experience sleep disorders than non-obsess. Rarely, these studies had focused on morbid obese patients. In this case-control study, we compared frequency data for excessive daytime sleepiness in 50 patients with obesity [Body Mass Index (BMI) ≥30 kg/m^{-2}] plus morbid obese patients (BMI ≥40 kg/m^{-2} or BMI ≥35 kg/m^{-2} plus one basic disease like Diabetes) and 50 healthy controls with normal BMI=18.5–24.9 kg/m^{-2}, paired for sex and age. The mean age in control and case groups was 39.78 (±10.58) and 39.5 (±10.70) respectively. The sleep assessment was based on the ESS (Epworth) questionnaire, this eight items questionnaire has been designed to determine a subject's likelihood to doze off or fall asleep in different situations. All questions are rated on a scale of 0–3; a score between 0–9 is normal, 10–15 is intermediate and more than 16 is a symptom for sleep disorders. We evaluated the frequency of the daytime sleepiness between case and control groups (52.7% versus 34%; odds ratio 2.16, 95% CI 0.98–4.77). Obese patients especially morbid obese patients reported significantly more daytime sleepiness than control group (p-value).

Session P12: Basic and Translational Neuroscience

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CROSS-CULTURAL ADAPTATION AND VALIDATION OF THE STROKE-SPECIFIC QUALITY OF LIFE QUESTIONNAIRE (SSQOL): GREEK VERSION

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Objectives: The purpose of this study was the cross-cultural adaptation and validation of the Stroke-Specific Quality of Life Questionnaire (SSQOL) in patients with stroke in Greece.

Methods: For the cross-cultural adaptation, the back-translation procedure was utilised, comprising forward and backward translations by 4 bi-lingual translators. In pilot study the questionnaire was completed from 17 subjects (9 healthy and 8 patients) for linguistic validation and understanding. A further sample of 26 patients with stroke (14 males, 12 females) aged 33–83 years old (Mean: 62.8, SD: 14.6) was included for the validity study. The time since initial stroke ranged from one month to 10 years. 19 patients had ischemic stroke and 7 patients hemorrhagic stroke. Subjects were requested to complete 4 questionnaires; the Stroke-specific Quality of Life Questionnaire as developed in its final Greek version and three other questionnaires already adapted into Greek, the Barthel Index, the SF-36v2 and the Beck Depression Inventory. Questionnaires were personally administered and completed via structured interviews by two physiotherapists. All interviews were taken place in rehabilitation clinics. For the statistical analysis Wilkoxοn rank test, Pearson's r correlation coefficient, Spearman r2 and t-test were all used for the several comparisons and correlations among questionnaires using the Statistical Package for the Social Sciences (SPSS, version 20.0). Ceiling and floor effects were also explored.

Results: Content validity of the Greek versions of the SSQOL questionnaire was achieved as all participants (including the ones in the pilot) found the questionnaires appropriate and comprehensible. Concurrent validity of SSQOL with Barthel Index demonstrated a non-significant moderate correlation with upper extremity function domain ($r2 = 0.43$, $p = 0.12$) and a strong correlation with self-care domain ($r2 = 0.78$, $p < 0.001$). The questionnaire demonstrated also moderate to strong correlations (r2 ranging between 0.38–0.77) with two of the SF-36 physical scales (Physical Function and Role Physical) and poor to moderate correlation with BDI (r2 = 0.06–0.44). No significant ceiling and floor effect were presented in the study. These scores appear somewhat comparable with findings across other countries.

Conclusions: The Greek version of the SSQOL questionnaire has proven to be valid, comprehensible and acceptable for the Greek stroke patients tested.

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IDIOPATHIC SCOLIOSIS – EXPRESSION OF ESTROGEN RECEPTOR 2 AND FIBER TYPE DISTRIBUTION IN BIOPSIES OF DEEP PARAVERTEBRAL MUSCLES

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Objectives: The pathogenesis of idiopathic scoliosis remains poorly understood. Both estrogens receptors 1 and 2 were identified in the muscle tissue. A potential role of an asymmetric expression of estrogen receptor 2 (ER2) in back muscles on both sides of the spinal curve has been suggested recently in the pathogenesis of idiopathic scoliosis. The altered function of the muscles in idiopathic scoliosis may also be mirrored by a change in fiber type distribution.

Methods: The pilot histochemical study included 32 biopsy samples from different deep paravertebral muscles obtained from eight patients with idiopathic scoliosis (5 females, 3 males) during posterior spinal surgery, and 15 control samples obtained from 5 patients without scoliosis. The muscle tissue samples were frozen in isopentane pre-cooled in liquid nitrogen. Serial cross-sections were stained for myofibrillar ATPase for the classification of fibers types and the fibers were counted in each biopsy to establish the distribution of fiber types. The expression of ER2 was studied by immunoperoxidase method and quantified.

Results: The analysis of fiber types revealed that the type I muscle fibers are more numerous on the convex side of the curve, occasionally showing type grouping. The number of ER2-positive nuclei (expressed per unit area or as a percentage of all nuclei) did not differ significantly among different subgroups, i.e. when comparing the patients with control samples, between the muscles at the convex and concave side of the curve as well as between the different fiber types.

Conclusions: Although we demonstrated changes in fiber type distribution in deep paravertebral muscles in idiopathic scoliosis, our pilot immunohistochemical data do not bring support for the suggested role of an expression of ER2 in back muscles in the development of idiopathic scoliosis. Supported by IGA NT/13693 – 4.

Session P15: Health

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A REVIEW OF PARKINSON'S DISEASE IN SUB-SAHARAN AFRICA

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Objectives: As the developed world's interest turns towards the prevention and management of non-communicable diseases, it is important to note that these diseases are of significant clinical relevance in developing countries also (1, 2). Neurological disorders, such as Alzheimer's and Parkinson's disease are an example of chronic, debilitating illnesses that remain largely neglected in African countries (3–5). When it comes to the treatment and management of patients, after a confirmed diagnosis, there are many issues for concern. Training for local doctors and health care professionals is much needed (35). Poor recognition of the cardinal symptoms, bradykinesia and tremor, (26) is not uncommon as local health care providers rarely come in contact with PD.

Methods: This review looks at the existing literature on Parkinson's disease and attempts to make suggestions for future research. There has not been a significant body of research into Parkinson's disease in Africa, and much of the data available dates back to the 1970s. It is difficult to look at the available information and be able to accurately compare PD prevalence and incidence rates among African populations themselves and with the world in general, for numerous reasons. Within the continent, crude prevalence rates have been shown to be lower in Western and Eastern countries where both the percentage of people over 60 years and life expectancy are lowest (5). Case methodologies, diagnostic criteria, classifications of PD, medical facilities and age distribution of populations all vary between studies (Zhang, 1993).

Results: Expert professionals are scarce; there is one neurologist per 3 million people in Africa, compared with one per 20,000

in Europe. Vital services such as EEG, CT scans, stroke units and even bed space are equally as limited. The median number of neurologic beds per 10,000 populations in low-income countries is 0.03, compared with 0.73 in high-income countries (6). In Ireland there are 11.9 MRIs per million population yet, until 2006 there was no MRI scan in the entire country of Ethiopia, and the cost of having a CT scan there falls on the patients themselves (7, 8). It is notable that two of the traditional healers originally involved in a study of PD in Tanzania (3) had never actually heard of Parkinson's disease, although this is not surprising as traditional healers often have different names even for well-known diseases.

Conclusion: Sub-Saharan Africa's fractured medical infrastructure poses a significant challenge to any of the above suggestions. In a country where even large hospitals can be found without MRIs and CTs (4), increasing awareness and improving management of PD remains difficult. However, as PD is predominantly clinically diagnosed much can be done if appropriate access to medication is possible. International academia, research institutions and NGOs will be very important in establishing a foundation on which concerted action towards improved recognition and provision for non-communicable diseases can take place.

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EVALUATION OF CLINICAL ASPECTS AND QUALITY OF LIFE AS RISK FACTORS FOR DEPRESSION IN PATIENTS WITH EPILEPSY

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The purpose of this study was to investigate clinical aspects and quality of life (QOL) as risk factors for depression in patients with epilepsy. One hundred and forty outpatients with a diagnosis of epilepsy who were attending our epilepsy center participated. Patients anonymously filled out a questionnaire with clinical data related to epilepsy. Depression level was evaluated by the Hamilton Depression Rating Scale-17 (HAMD-17), and quality of life was evaluated by the Quality of Life in Epilepsy-31 (QOLIE-31). Thirty-six patients with epilepsy suffered from depression (25.7%). Complex partial seizures (OR = 0.112) and number of seizure types (OR = 3.773) were found to be clinical risk factors for depression. Low scores for seizure worry (OR = 0.947) and social function (OR = 0.947) on the QOLIE-31 increased the probability of depression in patients with epilepsy.

Session P17: Public Health

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EPILEPSY: STIGMA AND MANAGEMENT FROM PAKISTAN'S PERSPECTIVE

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Introduction: Epilepsy is one of the chronic neurological disorders that have been an increasing burden to the developing countries. According to a systematic review of the magnitude, causes, and intervention strategies, 50 million people worldwide have epilepsy and approximately 90% of them are living in developing countries. According to WHO, 6 to 8 million people with epilepsy with addition of approximately 50,000 new cases annually and 3 to 4 million (assuming a national average treatment gap of 50%) remain untreated. In a poor resource country like Pakistan, epilepsy remains as a public health challenge. This study aimed to assess epileptic patient's knowledge, attitude, and practice for the management of epilepsy and to identify the needs of epileptic patients for the management of epilepsy.

Methods: A cross-sectional study is conducted through a structured questionnaire consisting of 35 items during Jan-April 2013 in Karachi, Pakistan. Data is collected from the epileptic patients coming to the public health hospitals of Karachi for treatment and analysed through SPSS version 17.0.

Results: A total 150 individuals were interviewed including 47% males and 53% females. Majority of them were under 20–29 age groups. The knowledge regarding epilepsy causation was minimal, 49.3% respondents considered it as a curable disease while 40% respondents considered it as a contagious disease. 60% reported super natural forces causing the disease followed by 55% respondents which reported the causation is due to some bad deeds. Emotional disturbance (66%) was the major triggering factor for epileptic fit among the respondents. Loss of Consciousness (85%), Urine Incontinence (70%), Salivation and Drooling (67%) were reported to be the major symptoms of epilepsy. Smelling of a shoe (71%) reported to be as the first measure during an epileptic fit. The most common complementary and alternative therapies used in the treatment of epilepsy included faith healers (80%), ayurvedic medications (57%) and homeopathy (10%) along with Modern drugs (63%). Poor socio-economic conditions, lack of education, religious concepts, and non-compliance from patient as well as from physicians were the main causes of treatment gaps.

Conclusion: Mostly Patients with Epilepsy have religious beliefs and erroneous perception of the disease which negatively influences the epilepsy management and increases the treatment gaps. Patients with epilepsy require same medical attention as in any other illness. Awareness programs should focus on the acceptance of epileptic patients in the community not only to improve the quality of life of epileptic patients but also their families and for reducing stigmatization of epileptic patients. The

main success factor for treatment of epilepsy lies in awareness, and efficient and effective utilization of resources for epilepsy management.

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FEMALE PATIENTS WITH MULTIPLE SCLEROSIS SHOWED INCREASE LEVELS OF C21 NEUROATIVE STEROIDS

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Steroids which act on the nervous system are known as neuroactive steroids (NAS). They act as modulators of ionotropic receptors in nerve cell membranes responsible for the permeability of relevant ions, thus influencing nerve excitability in both directions. Some NAS have well known neurpotective, immunomodulatory and remyelinisating effects. To chase up how the levels of NAS are differ between the patient with Multiple Sclerosis (MS) and healthy people we developed a Gas Chromatography-Mass Spectrometry (GS-MS) method for the simultaneously evaluation of 50 steroid including free NAS as well as conjugated ones. (steroid metabolome SM) We measured levels of the above mentioned steroids (in the sera of 13 female patients – 36 years old median age and 8 sex age matched healthy controls in the follicular faze of the menstrual cycle. At the next stage of the study we are going to measure the SM in the cerebrospinal fluid. The differences between the controls and patients were evaluated by a robust Mann-Whitney test. In addition, we applied a multivariate regression with reduction of dimensionality, known as orthogonal projections to latent structures (OPLS) to find relevant steroids differentiating between controls and patients. The OPLS method is effective in coping with the problem of severe multicollinearity within the matrix of independent variables. in the patients we found elevated levels of Pregnenolone (Preg) and Preg free and conjugated derivate, excluding Progesterone, which may indicate increased activity of adrenal cortex. For Preg, MS vs. controls predicted values, Sensitivity = 0.846 (0.5777, 0.9567); Specificity = 0.75 (0.4093, 0.9285) Further study will reveal if this results can be used for a diagnosis of MS and prognostic criteria for a progression of the disease. Supported by grant NT 31814 and project MZ CR for conceptual development of research organization 00023761 (Institute of Endocrinology, Prague, Czech Republic).

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CAN WE MEASURE THE LEVEL OF PRE-HOSPITAL CARE BY A MEDICAL RALLY?

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Objective: A medical rally (MR) has held as the practice event of the pre-hospital care in recent years in Japan. However, a medical rally is hosted once per year mainly with the emergency medical technician (EMS) and the staff of several university hospital facilities all around the Yokohama area. The result of one scenario station in Yokohama MR of which the theme was 'stroke' found out to be problem in 2008. The author impressed that EMS wasn't accustomed to stroke compared with the injury, the cardiac arrest and the acute coronary syndrome. Moreover, the tPA therapy was not sufficiently done which became a problematic issue in Yokohama area. The pre-hospital stroke life support (PSLS), the medical simulation course of pre-hospital care in stroke patients, held frequently as a regional effort to improve this problem recently. We reviewed the situation of the pre-hospital care for stroke in Yokohama area to compare with the result of stroke scenario in MR. Also, we will focus to whether we can measure the status of pre-hospital care form MR.

Material and Method: The result of stroke and BLS scenarios used in MR which were held in 2007 and 2008 were compared and evaluated. The evaluation items are:

1) Information gathering.
2) The diagnosis.
3) Treatment and action to the stroke.
4) Selection of hospital.
5) The judgment of indication to the t-PA therapy.

There are reviewed based on the lists of mark, which the estimator in the event used.

Result: Participants were ten teams, and 50 whole numbers in both years. The correct action rate was 57% in 2007 and 80% in 2008. On the other hand, the correct rate of BLS was 85% in 2008. The outcome of t-PA therapy improved between the last 6 months of 2007 and 2008.

Discussion: Though its environment differs from an actual site because MR is a game, it is not only a good educational tool but also good to review the evaluation of the actual treatment scene. MR may measure the level of pre-hospital care at least qualitatively, but not quantitatively if we compare to other scenario.

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DEVELOPMENT OF GUILLAIN-BARRÉ SYNDROME IN PATIENTS RECEIVING GANGLIOSIDE TREATMENT

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Although cases of Guillain-Barré syndrome (GBS) associated with intravenous use of ganglioside have been reported and brought their withdrawal from the market in European countries, it is still popular in Chinese market. The exact pathogenesis of GBS after treatment with ganglioside, however, remains unclear. High titers of anti-GM1 antibodies were found in some of the patients who developed GBS after intravenous injection of ganglioside. The acute motor axonal neuropathy (AMAN) model has been successfully established by sensitizing Japanese white rabbits with a bovine brain ganglioside mixture including GM1 and the pathological findings in the peripheral nerves of the immunized rabbits were similar to pathological changes in patients with AMAN. However, observational studies on the relationship between the incidence of GBS and the intravenous use of ganglioside failed to reveal a positive correlation. Thus far, the relationship between ganglioside and occurrence of GBS remains controversial. Here we present five patients who developed GBS after receiving ganglioside treatment which we suspected that there was an association between the treatment of exogenous ganglioside and GBS. All of them presented with acute or progressively flaccid paralysis, accompanied with respiratory failure requiring ventilation, without antecedent infection or other identified causes. The cervical MRI scan was normal which ruled out acute paralysis of the limbs caused by acute cervical myelopathy. The cerebrospinal fluid (CSF) examination showed an increase in protein level with cell count within the normal range. The diagnosis of GBS was further confirmed by electrophysiological examinations which revealed an impairment of axon of the peripheral neuropathy.

Session P18: Neuropharmacology

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SHOULD WE CONSIDER INTRAVENOUS LEVETIRACETAM AN ALTERNATIVE TO OLD ANTICONVULSANTS IN ACUTE SEIZURE MANAGEMENT IN NEONATES AND CHILDREN?

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Objective: Children with intractable epilepsy have frequent hospital admissions because of status epilepticus and acute repetitive seizures. Seizures are also seen in the neonatal period and are a major outcome of future adverse neurological sequelae. Intravenous Levetiracetam became available in August 2006 in patients aged 16 years and above. There is not enough data about safety and tolerability in children. We retrospectively analyzed data at our institution of children who received intravenous levetiracetam for acute seizure management.

Methods: A retrospective chart review was conducted on all preterm neonates, term neonates and children less than 18 years who received intravenous levetiracetam at Scott and White Hospital/Texas A & M HSC College of Medicine, Temple, TX. Subject data were acquired from electronic medical records. Approval of this retrospective analysis was given by our hospital' s institutional review board.

Results: We retrospectively analyzed 66 patients who met our inclusion criteria for neonatal seizures, status epilepticus and acute repetitive seizures and received intravenous levetiracetam. There were 31 (46.96%) males and 35 (53.03%) females. The loading dose of intravenous levetiracetam was 50 mg/kg in most patients followed by a maintenance dose of 25 mg/kg every 12 hours. The dose was infused over 15 minutes to an hour. The primary objective was to assess response based on clinical and electro graphic documentation. The secondary objective was to assess the indication of initiation of this medicine, adverse events and seizure control at well child visits. Response to levetiracetam was favorable. 56 (84.84%) out of 66 patients reached seizure freedom within 24 hours and 10 (15.15%) within 48 to 72 hours. No serious side-effects were apparent. Patients were switched to oral levetiracetam after discharge from the hospital of which 36 (54.54%) were discharged on monotherapy. The duration of follow up ranged from 6 months to 5 years.

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