

The Fourth Biennial Convention of the ASEAN Neurological Association was held on 22nd to 24th, March, 2001 in Kuala Lumpur, Malaysia. The followings are abstracts of the free papers presented.

Cerebrovascular Disease (1-33)

1. A 10-Year study on cerebrovascular accidents in 103 Army Hospital, Hanoi (1991-2000)

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A study was carried out on 1,379 stroke patients admitted to the 103 Army Hospital, Hanoi, from 1991 to 2000, with clinical examination and CT scan of the brain. The overall average age was 58.2 years. The peak age group for cerebral hemorrhage was 50-60 years and for cerebral ischemia, 60-70 years. 70.1% of the cases were male. Risk factors were identified in 59.1%, with hypertension being the most common, followed by atrial fibrillation, hyperlipidemia, alcoholism, smoking, diabetes mellitus and previous stroke. 71.1% of the stroke were ischemic, 28.9% hemorrhagic, while embolic infarcts accounted for 8.2% of the cases. The neurological signs on presentation according to frequency of occurrence were: motor paralyses (78.5%), cerebellar signs (11.4%), dysphasia (28.2%), altered consciousness (16.2%) and hyperalgesia (5.2%). CT brain scan were abnormal in 56.3% of the cases, showing ischemic or hemorrhagic changes in the supratentorial (58.1%) and infratentorial (7.6%) compartments. The mortality rate was 13.9% in the first month. The main cause of death was brain herniation, pneumonia and the other infections.

2. Risk factors of stroke and predictors of one-month mortality

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Background: Stroke is the third most common cause of death in Malaysia. It occurs in middle and late life. Risk factors and predictors of mortality of stroke in Malaysia are poorly understood. *Objective:* The aim of the study was to identify the major risk factors of stroke such as hyperlipidaemia, hypertension, diabetes mellitus, ischaemic heart disease, atrial fibrillation and smoking. Systolic and diastolic hypertension, hyperglycaemia, type of stroke, age >70, poor Glasgow coma scale on admission and deterioration of score as predictors for mortality were also analysed. *Method:* This was a prospective study of all stroke patients admitted to Penang General Hospital from December 1998 to November 1999. *Results:* A total of 246 (139 male and 107 female) patients were included. Median age was 65 years. Hypertension was the commonest risk factor (71.5%) followed by diabetes mellitus (40.2%) and hyperlipidaemia (37%). 74.8% of the cases were ischaemic in origin and 25.2% haemorrhagic. Mortality at one month was 20.3%. Deterioration of GCS, poor GCS on admission and haemorrhagic stroke were predictors of mortality. *Conclusion:* Hypertension, diabetes mellitus and hyperlipidaemia were the major risk factors of stroke. Poor GCS on admission with deterioration of score and haemorrhagic stroke were major predictors for mortality in these patients. Therefore control of blood pressure and diabetes mellitus is probably important in the prevention of stroke.

3. Carotid artery atheroma and its risk factors in ischaemic stroke in the Malay population

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Background: Atheroma in the extracranial arteries is reported to be less frequent in oriental and afro-caribbean populations and is rarely reported in Malay population. *Objective:* To study the profile of extracranial carotid artery using B mode ultrasonography and to determine the risk factor of IS who had carotid artery plaques in this Malay population. *Methods:* This is a cross sectional study. B mode ultrasonography was applied to all Malay patients with the first carotid artery system infarction, diagnosed by brain CT- scan, from August 1st 1999 – January 1st 2001. Patients who had cardioembolic stroke were excluded. *Results:* Of the 39 IS patients during the study period, 21 patients (54%) had carotid artery plaques. Of this 21 patients, all (100%) had hypertension, 14 patients (67%) had dyslipidaemia, 5 patients (24%) were smokers, 3 patients (14%) had diabetes mellitus and 4 patients (19%) had other risk factors.

Conclusions: 54% of IS patients in this Malay population had extracranial carotid artery plaques based on B mode ultrasonography. All these patients had hypertension.

4. Profile of hypertension in elderly patients in Indonesia

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Background & Objective: Hypertension is the leading risk factor for stroke with about 70% of patients with stroke having hypertension. In addition, the incidence of stroke increases with age. Hence the detection and adequate treatment of hypertension are important measures for the prevention of stroke and heart disease in the elderly age group. This study aims to investigate the profile of hypertension in elderly patients visiting the primary health center in Jakarta. *Methods:* Hypertensive patients aged over 55 years visiting the primary health center at Pasar Minggu, south Jakarta, from May to June 2000, were recruited. Blood pressure was taken using sphygmomanometer according to the procedure recommend by WHO. *Results:* 110 patients were recruited in the study, 58% were aged 55-64 years, 34% were 65-74 years and 8% were >75 years. Mild hypertension was found in 56%, moderate hypertension in 35% and severe hypertension in 9%. Isolated systolic hypertension was seen in 16%. Drugs used were: reserpine (76%), hydrochlorothiazide (10%) and captopril (14%).

Conclusion: Majority of elderly hypertensive patients attending a primary health centre in Jakarta was mild. Reserpine was used in close to three quarters of the patients.

5. Atrial fibrillation and symptomatic severe carotid stenosis

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Background: Recently symptomatic severe carotid stenosis (SSCS) has a high risk of recurrent stroke that can be significantly reduced with carotid endarterectomy. Symptomatic atrial fibrillation (AF), on the other hand, is best managed with long term anticoagulation. As these conditions have different management plans, we studied the frequency of concomitant AF and SSCS in our acute stroke trials database. *Methods:* The database is a prospective collection of stroke patients recruited into trials over 60 months from Dec 1995. Stroke subtype was classified by the Oxfordshire Community Stroke Project into TACI, PACI, LACI, POCI and ICH (Intracranial haemorrhage). We analysed patients with AF and severe ($\geq 70\%$ to subtotal occlusion) carotid stenosis, detected on Carotid Duplex/Doppler studies, that was referable to the presenting stroke. 30-day outcomes were

classified into alive & independent, alive & dependent or dead. *Results:* There were 414 patients in the database, after excluding POCl, ICH (94 patients) and 57 patients who did not have Carotid studies, 263 patients were analysed. 137 (52%) were men. Mean age was 65.8 years (range 31-89 years). Chinese constituted 82%, Malays 10% and Indians 8%. There were 23 SSCS (8.7%). SSCS was found in 16/209 (7.7%) of patients without atrial fibrillation and in 7/54 (13.0%) of patients with atrial fibrillation ($p=0.218$). Patients with SSCS and AF, and SSCS or AF had significantly poorer 30 day outcomes than patients without either conditions (6/7, 43/63 and 101/193 respectively were dead or dependent) ($p<0.001$). Patients with SSCS and AF, and SSCS or AF were also more likely to have more serious (TACI and PACI) strokes.

Conclusions: The presence of AF in a patient with acute stroke does not exclude the possibility of arterial emboli from a symptomatic severe carotid stenosis. Patients with AF and stroke should also have Carotid Doppler studies. Patients with both conditions have significantly poorer 30-day outcomes after stroke, and require further studies to determine the source of stroke and hence the most appropriate management.

6. Homocysteine and serum levels of ionized magnesium in acute stroke patients

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Background & Objectives: It has been reported that patients with a diagnosis of acute stroke exhibited early and significant deficits in serum ionized magnesium (IMg^{2+}). Since the major enzymes involved in homocysteine (HC) metabolism are magnesium (Mg^{2+})-dependent, it is distinctly possible that Mg^{2+} plays an important role in HC-related intracellular calcium ($[\text{Ca}^{2+}]_i$) overload. Therefore, the interrelationship between serum and total Mg^{2+} levels and elevated homocysteine levels after acute stroke appears to be a promising area of exploration. *Hypotheses:* Stroke patients admitted within 48 hours of an acute stroke have elevated levels of plasma HC compared to healthy controls, and increased plasma HC concentration in stroke patients will decrease IMg^{2+} and/or total Mg^{2+} levels. *Methods:* After obtaining informed consent, patients had blood taken after 12 hours of fasting. HC was measured using IMX apparatus (Abbott Lab). Total Mg^{2+} was measured using atomic absorption spectroscopy (Perkin-Elmer) and IMg^{2+} was measured using an ion selective electrode (NOVA biomedical). *Results:* Seventy-five patients admitted with a diagnosis of stroke exhibited early and significant deficits in IMg^{2+} . Total Mg^{2+} levels were unchanged. 27% of these stroke patients exhibited >40% reduction in mean serum IMg^{2+} found in normal health volunteers. The stroke patients also demonstrated significant elevation in serum levels of homocysteine. Interestingly, stroke patients with the highest recorded plasma levels of HC also had the lowest levels of IMg^{2+} and vice-versa.

Conclusion: Elevated levels of homocysteine may be by an as yet undiscovered mechanism leading to the depletion of available levels of serum ionized magnesium.

7. Polymorphisms of methylenetetrahydrofolate reductase: Relationship to levels of total plasma homocysteine and folate following acute stroke in Singaporeans

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Background & Objectives: A polymorphism in the methylenetetrahydrofolate reductase (MTHFR) gene (C677T point mutation) leads to reduced enzyme activity and an elevation in plasma homocysteine (pHC) levels, which may influence patient outcome. Therefore, we investigated the frequency of homozygotes for the C677T mutation and its relationship to plasma HC and folate (pF) levels in patients admitted for acute stroke in Singapore. *Hypotheses:* There are a significant number of acute stroke patients who have the C677T point mutation and elevated levels of pHC. MTHFR polymorphism-induced elevation in levels of HC is dependent upon pF levels. *Methods:* Sixty acute stroke patients were recruited and gDNA extracted from blood samples. Two primers, were used to

generate a 198 bp fragment. The PCR product was then digested with *Hinf*I and electrophoresed. Substitution of C to T at nucleotide 677 creates a *Hinf*I recognition sequence, which digests the 198 bp fragment into 175 and 23 bp fragments. The PCR products were also analysed by nucleotide sequencing. *Results:* 23 patients were heterozygous (- / -) and another 3 patients homozygous (+ / +) for the Ala to Val substitution in the MTHFR gene. Sequencing confirmed both mutations. Patients who are homozygotes had significantly elevated pHC levels (>40 % compared to healthy controls), which appeared dependent upon levels of pF.

Conclusion: There is a significant presence of the C677T mutation in Singaporean acute stroke patients. Regardless of genotype, the mutation produces an elevation in pHC levels that is dependent upon pF levels.

8. Homocysteine level in atherothrombotic cerebral infarction among Indonesians

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Background & Objective: Hyperhomocysteinemia is a known independent risk factor for atherosclerosis and atherothrombosis. This study aims to evaluate homocysteine level and the relation to other risk factors like hypertension, blood lipids, uric acid, hematocrit, smoking in patients with atherothrombotic cerebral infarction (ACI) among Indonesians. *Methods:* The plasma concentration of total homocysteine in 40 consecutive male patients with ACI and 40 sex, age-matched healthy controls were compared. *Results:* In ACI patients, the mean plasma homocysteine levels were significantly higher than in controlled subjects ($r < 0.012$; OR 3.22; 95% CI 1.74-5.65) with prevalence of about 73%. It had no correlation with hypertension and other risk factors like blood lipids, hematocrit and smoking. Hypertension was also an important risk factor ($r < 0.001$; OR 18.46; 95% CI 17.08-21.0).

Conclusions: A high plasma homocysteine level was a significant risk factor for atherothrombotic strokes among Indonesians with prevalence of about 73%.

9. Hyperhomocysteinemia in patients with ischaemic strokes at the University Malaya Medical Centre

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Background & Objective: Hyperhomocysteinemia has been established to have a strong and graded association with ischaemic strokes. There has been no previous studies into homocysteine levels of Malaysian patients with ischaemic strokes in contrast to published studies in Western populations. Accordingly, this pilot study had the following objectives (1) to determine the prevalence and degree of hyperhomocysteinemia among local patients admitted with confirmed ischaemic strokes (2) to ascertain if there were any significant differences in homocysteine levels between the various ethnic groups and between lacunar and large vessel strokes. *Methods:* This case-control study was based on consecutive first ever ischaemic stroke patients admitted to University Malaya Medical Centre (UMMC) from June to November 2000. Demographic and clinical information including known stroke risk factors were collected. Patients with known factors that affected homocysteine levels were excluded. Non fasting blood samples were collected within 1 week (day 3-4) of admission and processed in a standardized manner. Analysis was performed using a commercially available immunoassay. 76 subjects with comparable age and gender with no prior history of strokes or other known vascular diseases were recruited as controls. Patients in the 75th percentile of the control group was labelled as hyperhomocysteinemic while those in the 95th percentile group was labelled as moderately hyperhomocysteinemic. *Results:* 83 stroke patients were assessed which consisted of 52 males and 31 females. There were 80 subjects in the control group. The prevalence of mild

hyperhomocysteinemia was 33% (values from 12.0 micromol/l to 14.99micromol/l) while moderate hyperhomocysteinemia was 20% (values above 15 micromol/l). The mean plasma homocysteine level for stroke patients was 13.5 micromol/l (95% CI 11.82-17.6 micromol/l), significantly higher than in controls at 10.4 micromol/l (95%CI 9.9-11.1 micromol/l) ($p<0.0001$). No significant differences were found between the various ethnic groups and between lacunar and large vessel strokes. Multivariate statistical methods showed homocysteine to be an independent risk factor, adjusted for the usual stroke risk factors. Odds ratio of those with moderate hyperhomocysteinemia and stroke was 6.5 (95% CI 2.2 <OR <20.6) ($p<0.001$) compared with control subjects. In mild hyperhomocysteinemia, the odds ratio for ischaemic stroke was 3.2 (95% CI 1.6 < OR<6.5) ($p<0.001$)

Conclusion: Hyperhomocysteinemia was found in 53% of ischaemic stroke patients within UMMC. Homocysteine appears to be an independent ischaemic stroke risk factor in which there was a graded association. This association was greater in those with moderate to severe hyperhomocysteinemia. Dietary and genetic factors may play a role .

10. A preliminary study of plasma homocysteine levels in acute stroke patients

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Homocysteine (HC) is an intermediate during the conversion of the amino acid methionine and cysteine, and HC is commonly found in blood vessels. High levels of HC can be a potent toxin to our bodies because HC stimulates proliferation of blood vessel cells that help to form plaques and it also encourages clotting, a condition predisposing to strokes, heart attacks, and pulmonary embolism. The objective of this preliminary study is to investigate the relationship between strokes and abnormal levels of HC. *Methods:* After obtaining informed consent, 12-hour fasting blood from acute stroke patients was drawn. IMX apparatus (Abott Lab) was used to measure the levels of fasting plasma homocysteine. *Results:* Total of 184 acute stroke patients at Singapore General Hospital participated in this preliminary study. Many independent factors such as sex, race, and types of strokes were not associated with high levels of plasma homocysteine. However, acute stroke patients with atherosclerosis demonstrated a strong association with elevated levels of fasting plasma homocysteine.

Conclusion: The results in this preliminary study show that atherosclerosis is the only independent factor that is strongly associated with elevated levels of fasting plasma homocysteine.

11. Relationship of cerebrovascular and cardiovascular disease risk factors with serum cholesterol levels of Filipino children ages 4-12 years old

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Objective: The relationship of cholesterol level with the presence of potential factors that predisposes a child to future cardiovascular disease was investigated. *Methods:* Seventy-two children were studied. Questionnaires and consent forms were filled for presence of family history regarding cerebrovascular disease, coronary heart disease, diabetes mellitus, hypertension and obesity. Physical examination including height, weight, and the mean of 3 blood pressure measurements. Serum cholesterol determination was then taken. *Results:* In the female population, a reported family history of diabetes mellitus, obesity and age was significantly correlated with high cholesterol level. No association was seen with the blood pressure, weight as well as family history of hypertension and cerebrovascular disease. In the male population, a family history for stroke and hypertension was shown to have a significant association with high cholesterol levels. Age was also shown to be associated with high cholesterol level. The height, weight, blood pressure and a reported family history for obesity were found to be inversely correlated with the cholesterol levels.

Conclusion: This study draws attention to the relationship between cholesterol level and the risk

factors of future cerebrovascular and cardiovascular diseases. Although there are controversies in the cholesterol screening of children, the potential efficacy of controlling the progression of atherosclerosis in young adult by life modification seems promising.

12. Correlation between serum uric acid level and clinical picture in patients with acute ischemic stroke

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Background & Objective: Hyperuricaemia is frequently found in acute ischemic stroke. Apart from being an independent risk factor for stroke, this elevated serum uric acid level may be due to the acute stress reaction of the body to neutralize the toxic free radicals produced in cerebral ischemia. This study aims to investigate the pattern of serum uric acid level during acute phase of ischemic stroke and its correlation with the clinical improvement. *Method:* 39 eligible consecutive acute ischemic stroke patients was hospitalized in Ciptomangunkusumo Hospital, Jakarta, aged 45 – 64 years old, were included in this descriptive – analytic study. The serum uric acid levels were measured on the day-3, day-10 and day-21 of stroke onset and the neurological status was assessed using the Orgogozo stroke score on the same days. *Results:* Hyperuricaemia was found in 10.3% of the subjects. Mean serum uric acid level on day 3 was 325 umol/L and decreasing significantly to 318.0 umol/L on day 10 and to 302.4 umol/L on day 21 ($p = 0.04$). Mean Orgogozo score on day 3 was 63.6 and increasing significantly to 72.3 umol/L on day 10 and to 79.6 on day 21 ($p = 0.000$). Mean motor score on Orgogozo was 28.1 on day 3, increasing significantly to 34.5 on day 10 and to 40.9 on day 21 ($p = 0.000$). There was no significant correlation between the elevated serum uric acid level in the early phase of acute stroke with the clinical improvement on Orgogozo score ($p = 0.420$) and the degree of motor impairment ($p = 0.391$)

Conclusions: Serum uric acid level was increasing in the early phase and then decreasing spontaneously after the acute phase of ischemic stroke but there was no significant correlation between the serum uric acid level and the neurological score.

13. Observation of vertebral arteries in patients with transient ischemic attack by magnetic resonance angiography and transcranial doppler in Qingdao, China

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Objectives: To observe the vertebral arteries (VA) in patients with transient ischemic attack (TIA) in Qingdao. *Method:* We examined 57 patients who had been diagnosed to have TIA in VA territory with magnetic resonance angiography (MRA) and transcranial doppler (TCD) studies. The patients' characteristics were: 31 male, 26 female, age 39-78, mean age was 58 years. More than half of the patients had recurrent symptoms such as vertigo, dizziness. *Results:* Abnormal findings was found in 46 patients (81%). Sixteen patients (28%) had stenosis. They were: stenosis at proximal end of the VA (9/57, 16%), in 2/57 patients, the stenosis was bilateral; stenosis on the second segment of VA (4/57, 7%) and stenosis on intracranial segment of VA (3/57, 5.3%). Other findings were: tortuous VA (5/57, 9%), VA origin from common carotid artery (2/57, 4%) and absent VA on one side (1/57, 2%).

Conclusison: Close to a quarter of patients with vertebral-basilar TIA had stenosis of their VA in MR angiography.

14. Misdiagnosis in intracerebral haemorrhagic stroke

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Background & Objective: The definitive diagnosis of intracerebral haemorrhage (IH) or cerebral infarction (CI) can be made by CT-Scan, but due to lack of equipment or funds, this is not always easily available. The aim of this study is to look for correlations between IH volume and the diagnostic accuracy by clinical signs and scoring. *Methods:* This is retrospective study of all in-patients with IH confirmed by brain CT at the Hasan Sadikin Hospital, Bandung from January 1st 1999 through June 31st 2000. Neurological examination, Siriraj Stroke Score (SSS) and Algorithm Stroke Gadjah Mada (ASGM) were use for diagnosis. IH was divided into three groups based on size - small (<20 cc), medium (20 - 60 cc) and large (>60 cc). The accuracy of diagnosis in each group of IH using the examinations above were analysed with chi-square. The significant level was set at 0.05. *Results:* Of a total of 60 cases, 18 (30%) were diagnosed as CI by clinical examination alone. In the small IH group (36 patients), 14 (39%) were misdiagnosed clinically as CI, while in the medium IH group (24 patients), 4 (17%) were misdiagnosed as CI. Using the SSS, 25 (42%) were misdiagnosed as CI, overall, of which 20 (56%) were from small IH group and 5 (21%) were from the medium IH group. With the ASGM 19 (32%) overall were misdiagnosed as CI, of which 16 (44%) were in small IH group and 3 (13%) were in medium IH group. There were no patients in the large IH group. There was significant correlation between IH volume and accuracy by SSS ($\chi^2=5.78$, $P<0.05$) and ASGM ($\chi^2=5.39$, $P<0.05$), but for neurological examination had no significant correlation ($\chi^2=2.41$, $P>0.05$).

Conclusion: Small intracerebral hemorrhagic stroke were more often misdiagnosed as cerebral infarction.

15. The location of intracerebral hemmorrhage with hypertension

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Background & Objectives: Hypertension is the most important risk factor in intracerebral haemorrhage. We reviewed the location of intracerebral haemorrhage in Indonesian hypertensive patients. *Methods:* This is a retrospective review of the medical records of stroke patient seen at the Department of Neurology of Hasan Sadikin General Hospital, Bandung from July 1999 to June 2000. We found 246 cases of intracerebral haemorrhage. Ninety three cases of intracerebral haemorrhage were confirmed by brain CT scan . Hypertension was defined according the Joint National Committee VI (JNC) 1997. Systolic and diastolic blood pressure was taken at the time admitted to the hospital. *Results:* Of the 93 cases with intracerebral haemorrhage, 89 cases had systolic and/or diastolic hypertension. In 77 cases (87%), the location was in the basal ganglia: caudate nucleus (56 cases), thalamus (19 cases) and putamen (2 cases). In 12 cases (14%), the haemorrhage was in non-basal ganglia areas; lobar (10 cases) and cerebellum (2 cases). In the 4 cases without hypertension, the location was in the basal ganglia (3 cases) and cerebellum (1 case).

Conclusion: The main site of intracerebral haemorrhage in hypertensive patient was in the basal ganglia area.

16. A multicenter, nationwide validation of the Siriraj Stroke Score in the Philippines

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Objective: To validate the Siriraj Scoring among Filipinos with stroke. *Methods:* 433 adult stroke patients from six localities around the Philippines were evaluated using the Siriraj Stroke Score (SSS). CT-Scan findings were used to confirm the sensitivity of the scoring system. *Results:* As confirmed via CT-Scan, the sensitivity was 81.40% and 84.50% for intracerebral hemorrhage and infarction respectively.

Conclusion: The SSS can be a simple and effective bedside tool for differentiating a cerebral infarction and hemorrhage.

17. Electroencephalographic findings in acute stroke

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Objective: To describe the electroencephalographic findings in acute stroke diagnosed by CT scan or MRI and to determine if there is a correlation between the EEG findings, CT/MRI results and the neurological examination findings. *Method:* A total of 38 consecutively admitted patients at the Santo Tomas University Hospital, Manila, Philippines (20 males, 18 females) with a mean age of 64.7 years (range of 25 to 86 years old) were included in the study. An 18 or 21 channel EEG was recorded by a licensed technician within 48 hours of the onset of symptoms. *Result:* Nine (24%) had intracerebral hemorrhage, twenty-three (61%) had infarctions, and six had normal CT scans or MRI at the time of the examination. Of the six with negative scans, three had focal neurologic deficits. The group with the ICH showed the highest focality of slowing (78%) as compared to the infarct group (20%). Focal slowing was more common for the ICH group as compared to the infarct group.

Conclusion: Comparison of the EEG results with physical examination findings showed no significant correlation while comparison with the CT findings showed significant correlation. It is recommended to include a larger population size to further validate the findings and to use the immediate post-stroke EEG recording as a guide in prognosticating patients who are at risk for developing immediate and long-term complications.

18. Cerebral infarction evolving to haemorrhagic infarction

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Objectives: To assess the clinical features and CT scan findings at the time of haemorrhagic transformation (HT) in large supratentorial infarctions. *Methods:* We analyzed 300 consecutive patients with acute supratentorial ischaemic stroke who were admitted to acute stroke unit from November 1998 through October 2000. Of these 300 patients we chose 41 patients with HT due to large size of the middle cerebral artery (MCA) infarction. CT scan was performed in all patients on admission and one week after hospitalization. Duplex scan and TCD techniques were also used to identify the aetiology of cerebral infarctions. *Results:* The incidence of HT was 41/300 (14%). Haemorrhagic infarction (HI) was divided into HI type I 21/41 (51%), HI type II 13/41 (32%), parenchymal hematoma (PH) type I 5/41 (12%) and PH type II 2/41 (5%) according to the ECASS criteria in 1995. HT was detected in 22% of CT scan performed within the first 48 hours, but in 78% of CT scan performed one week after stroke. Clinically evident deterioration caused by HT was seen in only 2 patients (5%) in each instance within the first 48 hours after stroke.

Conclusions: Large supratentorial infarctions are an important factor in HT from stroke. Further studies are needed to confirm our findings among a large number of patients.

19. In-hospital complications after an acute stroke in patients admitted to Hospital Universiti Kebangsaan Malaysia

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Background and Objective: In Malaysia, there is limited information on the complications after an acute stroke in hospitalised patients. Our objective was to identify the type, timing, and frequency of medical and neurological complications following an acute ischaemic stroke and to determine the predictors of the occurrence of complications. *Methods:* We conducted a prospective study of consecutive patients with acute ischaemic stroke who were admitted to Hospital Universiti Kebangsaan Malaysia from June 2000 to January 2001. A single observer, using pre-defined diagnostic criteria recorded the demographics, risk factors and the type, timing, and frequency of complications that occurred during the inpatient period. *Results:* We enrolled 163 patients with ischaemic stroke. The complication rate recorded was 20.9%. The mean length of stay was 7.45 days. The most common complication was pneumonia (12.3%), followed by septicaemia (11.0%), urinary tract infection (4.3%), and upper gastrointestinal haemorrhage (3.7%). Depression and chest infection occurred early, whereas bedsores late. Among patients with ischaemic stroke, lacunar infarct was protective for the development of complications (OR 0.08; 95%CI 0.16 to 0.37). The independent risk factors for the occurrence of complications were diabetes mellitus (OR 2.87; 95%CI 1.06 to 7.78), MCA infarcts (OR 10.0; 95%CI 4.1 to 24.3), GCS less than 9 (OR 3.8; 95%CI 1.03 to 14.3), the presence of three or more risk factors (OR 2.5; 95%CI 1.02 to 6.5), and 10 days or more length of stay (OR 2.69; 95%CI 1.02 to 7.12).

Conclusions: The in-hospital complication rate in HUKM was relatively lower compared to other studies. This was mainly due to the shorter length of stay, and the establishment of a stroke team, which is almost identical to a stroke unit proposed in the literature. Knowing the nature, timing, and frequency of complications, together with the identification of high-risk patients, may be useful to plan future stroke services.

20. Blood pressure and outcome within three days of onset in patients with haemorrhagic stroke

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Objective: To evaluate the influence of blood pressure in the outcome of the early phase of haemorrhagic stroke. *Methods:* We followed up 55 recent haemorrhagic stroke patients for three days. Mean arterial BP (MABP) was taken twice daily. The patient's latest MABP measurement was noted in conjunction with the outcome (death or survival) each day. MABP cut off for day one was ≤ 145 mmHg and after day one was ≤ 125 mmHg. *Result:* Twenty out of 55 patients died within three days of stroke onset, 15 died within 48 hours (27.5%). Overall three-day outcome was not significantly influenced by overall averaged MABP, day one MABP cut off, or after-day-one MABP cut off. When Glasgow Coma Scale (GCS) scores taken into consideration, those with combination of GCS > 8 plus MABP ≤ 145 mmHg and/or MABP ≤ 125 mmHg, have better overall three day outcome than those with other combinations. Better outcomes were also found for those with MABP lowered to not more than 20% or not having MABP increments.

Conclusion: Early outcome in haemorrhagic stroke is not dependent on MABP or its fluctuation, but influenced by individual GCS scores changes. MABP should be controlled within 20% limit to get better survival.

21. Two-year stroke outcome - A cohort study of 500 patients

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National Neuroscience Institute, Singapore

Objective: This study was performed to investigate patient outcome after a stroke over a 2-year period. *Methods:* Study patients were identified by daily visits to the neuroscience departments where stroke patients are routinely admitted. Data was collected on demographics, pre-stroke status (Rankin score RS), and stroke subtype based on clinical and neuroimaging features (hemorrhage HE, lacunar infarct LC, non-lacunar infarct NL). Follow-up data was obtained at discharge (Barthel Index, RS), and at 3, 12 and 24 months post-stroke (RS, IST score, residence). Three attempts were made post-discharge to contact the patient, including 2 house visits. Data was analysed using SPSS. *Results:* We recruited 499 patients, mean age 64.4 years (range 20-93yr), 53.6% male. 23.2% had HES, 45.2% LC, 31.2% NL. At discharge, disability was none (NOD) in 25.6%, slight (SLD) 15.2%, moderate (MDD) 16.8%, moderately severe (MSD) 21.4%, severe (SVD) 11.4%; 8.4% died in hospital. Data at 24 months was available in 92.6%. At 3 months, NOD was 43.2%, SLD 14.0%, MDD 9.0%, MSD 12.2%, SVD 7.6%, and 13.0% dead, while at 24 months it was 29.8%, 14.2%, 9.6%, 7.0%, 5.8% and 26.2% respectively. Among LC, NOD/SLD was found in 77.4% at 3months and 52.7% at 24 months; for NL it was 42.3% and 35.5%, for HE 38.8% and 39.0% ($p < 0.05$ LCvsNL,HE). At 3 months, 21.4% reported full recovery, 32.0% partial, and 32.4% poor; at 24 months, it was 25.6%, 18.4% and 22.0% respectively. At 24 months, 62.4% were staying at home; 71.7% of LC, 57.8% of HE, 52.6% of NL ($p < 0.05$ LCvsNL,HE).

Conclusions: Mortality increased over time; disability among survivors reduced over time. LC had the best outcome with regard to mortality and disability. Community resource support will be needed even at 2 year post-stroke as many are still disabled.

22. Study of post-stroke depression in University Malaya Medical Centre: Prevalence and associations.

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Background: The emotional impact of stroke on the outcome of patients is large. Depression is the most common psychiatric disorder to follow stroke. Many investigators have quoted rates of post-stroke depression ranging from 18% to 61%. However there is no published local data available for post-stroke depression within the context of local setting. In addition, the contribution of functional disability, the side of the cerebral lesion and other factors to major depression after stroke were assessed. *Methods:* Major depression (using the Diagnostic and Statistical Manual of Mental Disorders IV criteria and Hospital Anxiety Depression Scale) and functional disability (using Modified Rankin Scale) were assessed in 50 patients who attended the neurology follow up clinic (four to eight weeks after their stroke). Brain lesion parameters were determined from computed tomographic scans and clinically. *Results:* The prevalence of major depression was 36%. Major depression was strongly associated with left hemisphere brain lesion compare to the right ($p = 0.03$). Stroke patients with significant physical disability (Modified Rankin Scale > 2) were more likely to be depressed ($p = 0.004$). Patients with a previous history of depression were also more likely to develop post stroke depression ($p = 0.04$).

Conclusions: Major depression is frequent after stroke, affects 36% of stroke patients 4 – 8 weeks after stroke. We emphasize the importance of psychiatric assessment of post-stroke patients, especially those with significant physical disability (Modified Rankin Scale > 2), a past history of depression and left cerebral hemisphere lesion.

23. Profile of cognitive impairment in patients with ischaemic stroke

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Background & Objective: The brain is the organ of the mind. Consequently, damage to the brain such as stroke may produce cognitive and physical disabilities. *Methods:* A prospective analytic study in Hasan Sadikin General Hospital was done on 36 ischaemic stroke patients admitted during July to October 2000, Mini Mental State Examination (MMSE) was used. First MMSE was conducted at discharge and the second MMSE 3 month after discharge. We used non parametric methods to compare median value of the first and second MMSE test. *Result:* There was statistically significance in associated cognitive impairment for subtests for orientation ($P < 0.001$) and recall ($P = 0.028$), but results were nonsignificant for attention and calculation, language, registration. We also found that MMSE scores significantly associated with age, embolic compared to atherothrombotic etiology and recurrent stroke. No statistically significant association between the MMSE scores and educational status, gender, first or recurrent stroke, location of lesions on CT Scan (cortical vs. subcortical, left vs. right hemisphere), one vs. more than one risk factors.

Conclusion: MMSE test in patients with ischaemic stroke provide statistical significant values for cognitive impairment, age and etiology (emboli vs. atherothrombotic).

24. Evidence of infusion ringer acetate with magnesium sulphate as add on therapy in acute ischaemic stroke - A prospective study

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Background: During cerebral ischaemia, impaired auto regulation leads to anaerobic metabolic processes i.e. increase of lactic acid, influx of sodium and calcium ions into neuronal cells with osmotically obligated water. The focal acidosis promotes apoptosis. The strategy of stroke therapy is to save neurons in the penumbra, which remains viable for a period of several hours, perhaps up to 48 hours after insult. We propose an infusion of a combination of ringer acetate and magnesium sulphate, an isotonic solution without lactate and glucose, as neuroprotective therapy. The neuroprotective effect of magnesium sulphate is due to its properties of being a non-competitive blocker of the NMDA receptor, an antagonist of calcium entry into cells and a contributor to the intracellular metabolic processes in producing ATP. *Objective:* To evaluate 15 patients receiving infusion of ringer acetate with magnesium sulphate as an add-on therapy in acute ischaemic stroke. *Methods:* This is a prospective, open-labelled study. We gave 500 ml of ringer acetate combined with 400 mg of magnesium sulphate as an infusion, at approximately 1500 ml per day, for three days (the total dose of magnesium sulphate, 3600 mg). Concomitant therapy included intravenous CDP choline 3 x 250 mg/day and per oral aspirin 2x100 mg/day. We use Orgogozo scale to assess the patients. *Results:* 80% of patients infused with ringer acetate plus magnesium sulphate improved in their clinical condition.

Conclusion: In acute ischaemic stroke, infusion ringer acetate with magnesium sulphate may contribute a better clinical outcome for the patients. However this is a preliminary reports that need further multi-centre trials.

25. Cost-minimisation and the number needed to treat in secondary prevention of stroke with antiplatelet medications

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The burden of stroke therapy has been ameliorated to a great extent with the use of anti-platelet agent for secondary prevention. The cost of health care in general is rising. Economic factors play a significant role in the cost of hospitalisation for stroke patients in general and in the choice of anti-platelet agents in particular. The goal of this study is (1) to compare the total costs associated with prescription of antiplatelet drugs, (2) to determine the number-needed-to-treat (NNT) with each of the different antiplatelet drugs in the market: aspirin, dipyridamole, ticlopidine, cilostazol and clopidogrel, and (3) determine the direct cost incurred with the use of each antiplatelet drug. To do this, a cost-minimisation analysis of total costs was done. Data were collected from all randomised control trials published evaluating drug treatment vs. placebo. Event rates, absolute risk reduction and NNT were calculated. Cost computation was done for direct medication cost and additional expenses were included for treatment or monitoring of adverse effects. Transportation and professional fees were excluded. The results of the study showed the following: NNT for ASA: 33, DP: 50, DP-ASA: 17, ticlopidine: 33, cilostazol: 17, and clopidogrel: 100. Direct cost for two years treatment for ASA: P13, 678.90; DP: P 18,615.00, DP-ASA: P 31,615.00, ticlopidine: P 77,060.00, cilostazol: P 64,240.00 and clopidogrel P 64,240.00. Total costs to prevent 1 stroke in two years treatment for ASA: P 451,403.70, DP P 930,750.00, DP-ASA P 537,455.00, ticlopidine P 2,542,980.00, cilostazol P 1,092,080.00 and clopidogrel P 6,424,000.00. We conclude that aspirin should be the mainstay of therapy in preventing secondary stroke.

26. Percutaneous recanalisation in acute cerebral thromboembolism

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Background & Objective: Cerebral cellular death occurs 4 minutes after cessation of perfusion. The presence of collateral circulation may prolong the viability of the neurons. We present a patient who had a successful recanalisation within 2 hours 45 minutes after right MCA occlusion and its neurological outcome. *Result:* A 45-years old male suffered an acute cerebral thromboembolism during a coronary angiogram. A thrombus was dislodged into the M1 segment of the right MCA. Immediate intra-arterial infusion of ReoPro was done via a catheter in the right CCA but was to no avail. General anesthesia was administered due to severe restlessness. Superselective cannulation of the right MCA was performed with a microcatheter. Pulse-spray thrombolysis with rT-PA was done and the artery was completely recanalised after 45 minutes. The total dose of rT-PA used was 15 mg. A total ischemic time of 2 hours and 45 minutes was recorded. Cerebral resuscitation with iv mannitol and dexamethasone was done after the thrombolysis. An immediate CT scan revealed moderate right hemispheric edema. Marked hyperintense watershed signal changes were noted on the MRI. No evidence of cortical or lacunar infarction of the internal capsules nor evidence of secondary bleed. The patient had a complete recovery with minimal focal sensory deficit despite the extent of signal change in the MRI. The NIH stroke scale was 1 and Glasgow Outcome Scale 1 on follow-up. *Conclusion:* Acute cerebral infarction is a treatable disease. Timely recanalisation within 3 hours is a good time period to achieve on clinical ground, both to prevent or improve the neurological sequelae and minimize the risk of secondary bleed.

27. Percutaneous revascularisation of subacute intracranial left vertebral artery occlusion

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Objective: To report a case of percutaneous recanalisation of intracranial arterial occlusive disease in the treatment of ischemic stroke. *Result:* A 51 year-old male presented with four months history of progressive ataxia, dysarthria and 12 days of left ptosis, facial palsy and right hemiparesis (power grade 3). He is hypertensive for 15 years and is hypercholesterolaemic. His NIH stroke scale was 14, and Rankin scale: 5. MRI revealed a hyperintense lesion in the left lateral medullary column consistent with a lateral medullary syndrome. A MRA showed an occluded left vertebral artery. A cerebral angiogram confirmed the occlusion of distal left vertebral artery from the level of foramen magnum up to the 1 cm from its confluence with the basilar trunk. The left PCA and PICA were occluded. There was 50% stenosis of the distal right vertebral artery. Mild pial collaterals were supplying left PICA territory. No significant cross over supply via the posterior communicating arteries. A pulse-spray thrombolysis with rT-PA partially recanalised the left vertebral artery and revealed a long tight stenosis. Angioplasty was done with a 3 mm intracranial balloon but failed to dilate a segment of critical stenosis. A 3.5mm -15 mm coronary stent was inserted and successfully reopen the artery without residual stenosis. The left PICA and PCA reopen after the stenting. The patient experienced a partial but remarkable recovery after the procedure. His ataxia and left hemiparesis improved partially but the facial paresis resolved completely. Follow up at 3 months revealed only residual left ptosis and dense sensory loss in the right lower limb. The NIH stroke scale was 3, Rankin scale: 1 and Glasgow outcome scale: 5. A colour Doppler study revealed a widely patent left vertebral artery with normal antegrade flow and systolic velocity of 41 cm/s.

Conclusion: Percutaneous recanalisation using a combination of thrombolysis, angioplasty and stenting is a feasible option in the management of both acute and subacute stroke. This technique should be encouraged in the new management of cerebral ischaemia. Proper and careful selection of the potential candidate is however prudent to avoid catastrophic sequelae.

28. Outcome of patients with malignant middle cerebral artery infarctions: A comparison between hemicraniectomy and medical therapy

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Background & Objectives: Malignant middle cerebral artery (MCA) infarctions occur in up to 15% of all supratentorial strokes and is associated with a mortality rate as high as 80%. This study was undertaken to compare the outcome of patients with malignant MCA infarction treated with medical therapy alone versus medical therapy plus hemicraniectomy. *Methods:* From the St. Luke's Medical Center Stroke Data Bank, patients 18 years and above presenting with large MCA infarctions admitted from January 1, 1999 – January 1, 2000 were identified and analyzed. Demographic features, risk factors, Glasgow coma scale, Rankin, NIHSS index during admission, prior to surgery, on discharge and on follow-up, and in-hospital mortality were compared. *Results:* Large MCA infarction (mean NIHSS = 18.4) comprised 41/651 (63%) of all strokes admitted from January 1999 – January 2000. Malignant transformation occurred in 11/41 (26.8%). Most of the patients were female (6/11), with a mean age of 61 years. One or more vascular risk factors were present in 10/11. Hemicraniectomy was performed in 7 cases while 4 remained on medical therapy. In the medically treated group, 3 (75%) patients died of cerebral edema. The 4th patient was discharged with a Rankin score of 5, which improved to 2 at 6-month follow-up. Hemicraniectomy was performed at a mean of 47.6 hours from ictus (range 23 – 80 hours) In this group, mortality was 2/7 (28.5%) at discharge and remained unchanged on follow-up (p=0.376). Mean Rankin score at discharge was 4.4, which improved to 3.4 on follow-up.

Conclusions: Overall mortality for malignant infarcts was in line with findings from other studies.

In-hospital mortality rate was lower in the hemicraniectomy group. All patients had improved Rankin scores on follow-up. Hemicraniectomy for malignant infarcts may be life-saving and may reduce functional disability at long-term.

29. Reasons for the delay in hospital admissions among stroke patients seen at Jose R. Reyes Memorial Medical Center, Manila

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Objectives: To determine the reasons for the delay in hospital admissions among stroke patients seen in our institution. *Methods:* A descriptive study involving 540 stroke patients seen and admitted at JRRMMC from March to August 2000 *Results:* A total of 540 patients were included in the study. The mean age of patients in the study was 57 years old, with male patients comprising 62% of the population. Cranial CT scan was done in 66% of cases. A total of 155(29%) of patients were brought to the emergency room between 0-3 hours after the onset of the initial symptom of stroke, 104 (19.2%) at 4-6 hours, 84(15.5%) at 6-12 hours, 52(9.6%) at 12-24 hours, 62 (11.4%) cases at 24-48 hours, and 83(15.3%) cases were seen more than 48 hours after stroke. About 155 (34%) of cases occurred at 6am-12nn, 111(24%) at 12nn-6pm, 87(19%) at 6pm-12mn and 102(22%) of cases occurring from 12mn to 6am. Major factors for the delay in hospitalization included transportation problems for patients seen at 0-12 hours after stroke. Patients seen between 12-48 hours were initially seen by local physician or admitted at a nearby clinic or hospital for initial treatment. Patients who came in more than 48 hours after stroke onset were initially observed at home or brought to a traditional health care giver.

Conclusion: About 47.9% of stroke patients seen at our institution were seen during the first 6 hours after onset of initial symptom of stroke. Major factors for delay are transportation-related problems, consultation or admission at a local clinic and initial refusal for hospitalization.

30. Delay time in the care of acute stroke patients

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Background: Early, correct diagnosis is necessary for successful management in acute stroke. By analyzing presentation times and referral patterns among our stroke population, sources of delay can be pinpointed for specific intervention. *Objective:* To identify areas of delay in the care of acute stroke patients. *Methods:* Using structured questionnaire and chart review, time interval from symptom onset/awareness to initial presentation, time to neurology assessment and performance of Cranial CT scan were gathered from patients enrolled at the SLMC Stroke Data Bank from May - August 2000. *Results:* Data from 153 patients (87males, 66 females) were analyzed. 101 patients (66%) had cerebral infarction, 43 (28%) intracerebral hematoma and 9 (5.9%) subarachnoid hemorrhage. Eighty seven patients (56.8%) presented for consult within 3 hours from symptom onset/awareness and 71.2% within 6 hrs (median time = 1.75 hours, range 5 minutes to 47 hours). Presentation was significantly earlier among patients with hemorrhagic strokes (median = 1 hour) than among those with infarction (median=3hours). Initial medical contact was with a physician in 96% of cases and in a hospital setting in 79%. Only 3% consulted directly a neurologist. Initial presentation to neurology evaluation was a median of 7.5hrs. Initial presentation to imaging took a median of 5.5 hours. Delay was significantly shorter for patients brought to hospitals with neuroimaging facilities (median = 2 hrs) than for patients brought to hospitals without (median = 14.5hrs).

Conclusion: "Patient" factor is only one source of delay in the acute care of our stroke patients. More delays were accounted for by healthcare-related factors: delays in hospital admission, physician/neurology referral, and neuroradiologic diagnosis. Physician and public health education rapid neurology evaluation, and prompt patient transport to CT-equipped hospitals /"Stroke centers" are necessary.

31. Views regarding stroke diagnosis and management among non-neurologists: A preliminary report

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Background & Objective: In 1999, the Stroke Society of the Philippines published guidelines in the diagnosis, prevention and treatment of "brain attack" or stroke. Last year, members of the society conducted lectures on stroke based on these guidelines among physicians who were non-neurologists in various regions of the Philippines. In line with the information dissemination, this study was conducted to investigate the level of awareness of the participants on stroke as well as to assess the impact of these lectures in as far as changing misconceptions they may have regarding stroke diagnosis and management. *Methods:* A survey in the form of a ten-item questionnaire dealing with stroke recognition, prevention and management was distributed to the participants before and after the lecture in each site. The answers to each question as well as the change in the pretest and posttest responses were measured and analyzed. *Results:* A total of 145 physicians from four provinces completed the pretest and posttest questions. Most of the participants were internists and general practitioners. The mean pretest score was 6.9 which improved significantly after the lecture to 7.7 ($p=0.000$). However, weaknesses on certain aspects on stroke needing improvement such as recognition of stroke as well as anticoagulation in cardioembolic stroke were also identified.

Conclusion: The participants only adhered to select points in the guidelines. As a whole, the stroke lecture produced a positive impact on its target audience. It reinforced what the physicians already knew and corrected important misconceptions on stroke.

32. Stroke knowledge among family members of stroke patients: A preliminary study

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Background & Objectives: Community stroke education is needed to improve early stroke recognition and reduce delays in the referral of stroke patients. In many countries, there are stroke support groups, where family members of stroke patients are members of these groups, becoming important promoters of stroke educational programs. However, there are no specific data about information status among family members of stroke patient. *Methods:* A cross-sectional questionnaire survey among family members of stroke patient was done in the outpatient clinic of the Department of Neurology, School of Medicine, North Sumatra University/Adam Malik General Hospital, Medan. Sample size was calculated by means of a formula. The questionnaire asked for stroke knowledge and sociodemographic and medical data. Stroke knowledge was excellent if a participant knew (1) at least 2 stroke symptoms (good symptom knowledge) and (2) at least 2 stroke risk factors (good risk factor knowledge), as well as knowing (3) that immediate hospital admission is necessary in case of stroke (good action knowledge). *Results:* A total of 92 family members of stroke patients took part in the study. Most of them were 50-59 years old (29.3%), female (66.3%), senior high school education (53.3%), house wives (45.6%) and patient's wife (55.5%). Of the stroke knowledge, 35.9% had good symptom knowledge, 16.3% had good risk factor knowledge, and 39.1% had good action knowledge. Stroke knowledge was excellent only in 4.4% of subjects. When asked for the body part affected by a stroke, only 27.2% listed the brain or head.

Conclusions: Overall, more than half of family members of stroke patients did not have good knowledge about stroke. Physicians should give better information to the public about stroke, and building stroke support groups could be considered.

33. Information dissemination campaign on stroke awareness among residents of Sta. Cruz, Manila, Philippines - An evaluation

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Objective: To increase the level of awareness among the residents of Sta. Cruz, Manila, Philippines on stroke risk factors, signs and symptoms and prevention through information dissemination

Significance: With the increasing cases of stroke affecting different ages in our country, the present study is supportive of the National Cardiovascular Awareness and Prevention Program of the Department of Health. *Method:* Sta. Cruz Manila is a densely populated community composed of 118,903 residents with the majority belonging to the low - middle income group. A ten-item questionnaire, written in the vernacular, was administered to 520 randomly selected residents. The questionnaire was readministered after information dissemination through a series of lectures, pamphlets and poster presentation. *Results:* Out of the 520 respondents only 8 (1.54%) got the perfect score on the pretest compared to 64 (12.32%) on the post test. Four hundred (76.9%) knew that stroke was not a disease of the brain but of the heart, 464 (89.2%) answered correctly that stroke is not communicable. There was overall 13.5% improvement on mean pretest and post test scores.

Conclusion: There remain gaps on the knowledge on stroke risk factors, signs and symptoms and prevention among the residents of Sta. Cruz, Manila. Education partly increased the level of awareness among the respondents. More intense and regular information dissemination campaign should be done in Sta. Cruz, Manila and other areas in our country. Educational campaign can be strengthened through the involvement of multisector such as the media, health centers, schools, private and government organizations.

Epilepsy (34-43)

34. Prevalence of epilepsy in Ha Tay, Vietnam

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Background & Objective: Ha Tay is in Northern Vietnam. The population is approximately 2,300,000 of whom 1.9% are minorities, living in the mountainous area. This is a community based study on the prevalence of epilepsy in Ha Tay. *Method:* The study involved a survey of 80,557 subjects randomly scattered in 11 Dweller's Associations, with a population structure and geography similar to that of all Ha Tay province. Each of the Dweller's Association has its own Health Village Centre. They take care of simple medical problems and operate effective community health care programs. The survey was divided in to 2 stages: (a) Screening stage: house-to-house survey was conducted by trained-interviewers (nurses, physicians) with screening questionnaires (Specificity=42.3%, Sensitivity=96.1%). During the survey field workers acted as guides. (b) Examination stage: all individuals identified as positive in the screening stage were examined by junior neurologists then checked by senior neurologists. The diagnostic criterion was primarily clinical manifestations based mainly on eyewitness descriptions. EEG, prescriptions of anti-epileptic drugs were considered as supportive evidence. Seizure classification followed ILAE's classification (1981). The definition of epilepsy, active epilepsy, remote symptomatic epilepsy and putative causes are according to the Guidelines for Epidemiological Studies on Epilepsy by ILAE. *Results:* The survey was conducted from October 1998 to April 1999. Crude prevalence for all case was about 4.9/1,000 population, 4.6/1,000 for active epilepsy, highest within the first two decades of life (7.8/1,000). The prevalence was higher among males (5.5/1,000) as compared to females (3.7/1,000). The most common seizure type was generalized (75%), tonic-clonic seizure (85%), partial seizure (22%). Unclassifiable seizures accounted for 4%. Remote symptomatic seizure was seen in 39%, 31% of whom were from intracranial infection.

Conclusion: The prevalence of active epilepsy in Ha Tay, Vietnam was 4.9/1,000 populations. It falls in the range of the prevalence reported elsewhere.

35. Long term prognosis of generalized tonic-clonic seizures

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Objective: To study the long term prognosis of generalized tonic-clonic seizures (GTCS) in terms of seizure control, development of structural and metabolic pathology or deterioration of mental functions within a 10-year observation period. *Method:* This is a descriptive study of patients who presented with purely GTCS and who had a 10-year follow up. They were expected to have a normal physical and neurologic examination. Demographic data and outcome of the illness were noted. *Results:* Majority of patients had their onset of GTCS at <10 years of age. There was a slight male predominance. The rate of remission for all age groups with or without treatment was 66%. 34% had recurrent seizures. No patients developed structural or metabolic pathology and none had mental deterioration.

Conclusion: GTCs has an excellent outcome.

36. A study on children with intractable epilepsy in Vietnam

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Background: About 70-80% of epilepsy in children can expect a one-year remission, but remaining patients develop intractable epilepsy. *Objective:* To study the risk factors of intractable epilepsy in children. *Methods:* A total of 16 cases with intractable epilepsy, aged from 8 to 15 years old, treated with 2 different AEDs, were followed up for one year in University Hospital 103 (1998-2000). The diagnostic criteria of intractable epilepsy was based on that by Jorgen Alving (1995). The clinical and laboratory findings were evaluated to assess the risk factors for intractable epilepsy. *Results:* The 16 patients consisted of 11 males (69%) and 5 females (31%). 7 patients (44%) had two types of epilepsy, 4 patients had tonic seizure combined with tonic-clonic seizure and 3 patients had absence with tonic-clonic seizure. The others had tonic-clonic seizure (5 patients), complex partial seizure (2 patients) and partial seizure (2 patients). 13 patients (81%) had high number of seizure before treatment. 4 patients had structural lesions shown in brain CT scan. 7 patients (44%) had mental retardation. 10 patients (63%) patients took traditional medications instead of the modern anti-epileptic drugs. 5 patients (31%) was irregular in their anti-epileptic medication. 5 patients (31%) failed to attend follow-up despite uncontrollable seizures. One patient was untreated.

Conclusion: The main risk factors of intractable epilepsy in this study were: structural brain lesion, mental retardation, multiple seizure types, high number of seizure and poor compliance to treatment.

37. Some factors that influence memory dysfunction in adult epileptic patients

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Background: Epilepsy is neurological disease frequently found in society with incidence rate 0.5 per 1,000 and prevalence rate 4 - 12 per 1,000. Epidemiological studies show that one third of epileptic patients have disturbance of cognitive function especially memory function. The study on memory dysfunction in epilepsy is difficult due to the multiple risk factors. *Hypothesis :* Age, gender, education, seizure type, duration and frequency of seizures, age of the first onset, EEG abnormality, number and type of anti-epileptic drug, duration of treatment, are factors influencing memory dysfunction in adult patients with epilepsy. *Methods:* Cross sectional study on 101 patients seen in September 2000 - January 2001 at Neurology Out-patient Department of Dr. Soetomo Hospital. The inclusion criteria were: aged 13 - 70 years, education minimally 6 years (elementary school), and is no permanent neurological deficit. Memory function examination were done by using digit repetition for immediate memory, four unrelated word test and retelling short paragraph for verbal recent memory, picture tests for non verbal recent memory and information of personal data and history for remote memory. Statistical analyses were carried out using the chi-square and t-tests. *Result:* Of the 101 subjects, immediate memory disturbance was found in 19.8%, 5-10 minutes verbal recent memory was abnormal in 56.4%, 30 minutes verbal recent memory was abnormal in 31.7%, and short paragraph verbal recent memory was abnormal 84.2%. Irritative EEG appearance (P= 0.042), age (P= 0.02) and age of the first onset (P = 0.05) appeared to be risk factors in the short paragraph verbal recent memory test.

Conclusions: Irritative EEG appearance, age and age of the first onset were the risk factors for short paragraph verbal recent memory dysfunction in epilepsy patients.

38. Serum transaminase and gamma glutamyl transpeptidase in epileptic patients receiving phenobarbital, phenytoin and carbamazepine

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Background: Phenobarbital, phenytoin and carbamazepine, the most widely used antiepileptic drugs for seizures control, can by inducing cytochrome P450, and lead to enhanced production of toxic metabolites. *Objective:* The aim of this study is to discover the effect of long-term phenobarbital, phenytoin and carbamazepine therapy on liver by examining serum transaminase (SGOT, SGPT) and serum gamma glutamyl transpeptidase (GGT) levels. *Method:* We investigated 65 epileptic patients who received phenobarbital, phenytoin and carbamazepine for 6 months or longer and 65 controls in Ciptomangunkusumo Hospital. Diseases or other conditions which may increase serum SGOT, SGPT and GGT were excluded. To exclude viral hepatitis B and C, serological markers (HbsAg and anti-HCV) were examined. *Results:* Fifty-five patients received monotherapy (phenobarbital in 18 patients, phenytoin in 20 patients, carbamazepine in 17 patients). The remainder received combination of phenobarbital with phenytoin or carbamazepine. There was significant difference in serum SGOT between patients and controls (patient 23.38 IU/L, control 18.65 IU/L, $p = 0.001$). Serum GGT was also significantly higher in patients than controls (patient 64.02 IU/L, control 20.08 IU/L, $p = 0.000$). The highest level was found in patients on phenytoin. There was no significant difference in serum SGPT between patients and controls. We noted, a declining tendency of serum SGOT in long-term phenytoin therapy ($r = -0.472$; $p = 0.000$) and serum GGT in long-term carbamazepine therapy ($r = -0.357$; $p = 0.000$).

Conclusion: Long-term phenobarbital, phenytoin and carbamazepine therapy lead to abnormality of liver functions in epileptic patients.

39. Random total homocysteine sampling in patients with enzyme inducing antiepileptic drugs.

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Background & Objective: Moderately elevated plasma homocysteine is a known risk factor for atherosclerosis. Patients on enzyme inducing antiepileptic drugs (AED) like phenytoin and carbamazepine has been associated with elevated homocysteine levels on fasting or 6-hours post methionine homocysteine levels. This study aim to investigate whether random sampling of homocysteine can also show abnormality of homocysteine. We also investigated the association of elevated homocysteine with various biochemical and drug related parameters. *Methods:* Epilepsy patients with at least one year of stable enzyme inducing AED were selected from the Neurology clinic for the study. Consent and blood was taken for homocysteine, iron assays, drug levels, renal and liver function. Control levels of homocysteine were obtained from healthy subjects matched for age and sex. *Results:* There were 21 epilepsy patients recruited for the study and equal number as controls. The mean age was 36.3 and 36.9 years respectively ($p=0.9$). The mean homocysteine levels for the study and control subjects were 11.9 and 9.0mmol/L ($P= 0.01$). 8 patients (39%) had elevated homocysteine of >11.8 mmol/L (2SD of mean control). Using univariate analysis of the total study group, homocysteine levels correlated with the duration of carbamazepine therapy ($r=0.9, p=0.01$) and dose of phenytoin ($R=0.6, p=0.01$). For patients with elevated homocysteine levels, a positive correlation was found with phenytoin dose ($R=0.9, p=0.02$) and dose of carbamazepine ($R=1.0, p=0.6$). *Conclusion:* 39% of patients on enzyme inducing AEDs had elevated random total homocysteine level. The hyperhomocysteinemia was correlated with dose of phenytoin, the dose and duration of carbamazepine.

40. Public awareness, attitude and understanding towards epilepsy in Medan, Indonesia.

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Background & Objective: Management of epilepsy needs a comprehensive approach. The community's knowledge and attitude towards epilepsy is thus an integral aspect of the comprehensive management. This study aims to investigate the public awareness, attitude and understanding towards epilepsy in Medan. *Methods:* There were 249 respondents in this study. The survey questionnaire was according to cave ness, with a few modifications. The respondents were medical students, public health students, literature students, nursing academy students, neurology ward nurses, and relatives of neurology ward's patients. The questionnaire was given without prior briefing and discussion on epilepsy. *Results:* 200 respondents (80%) were women and 65 respondents (26%) were married. Only 14 respondents (6%) had previously participated in Epilepsy Organization campaign. 157 respondents (63%) had seen at least one epilepsy attack. Majority of respondents (239, 96%) had read or heard about epilepsy. 217 respondents (87%) would accept epilepsy patient as a friend and did not mind their families do the same. However, there were 42 respondents (17%) who believed that saliva of patients was able to spread the disease.

Conclusions: More efforts on epilepsy public education is needed in Medan, Indonesia.

41. Epilepsy patients' knowledge of their disorder: An assessment in Medan, Indonesia

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Background & Objectives: One of the important aspects of comprehensive care for epileptics is patient education. In Indonesia, to our knowledge no previous study has been done assess the knowledge of patients on epilepsy. *Methods:* 53 epilepsy patients were recruited for the study, 29 patients from Adam Malik General Hospital and 24 patients from three private neurology clinics in Medan. The patients were asked to complete a knowledge questionnaire adapted from that by Long et.al. The questionnaire were on safety, compliance and legal issues. Questionnaire scores were correlated with demographics, duration of illness and formal educational. Data was analyzed as a group as well as separately for the Hospital and private clinics. *Results:* The average age of the 53 patients was 26.45 ± 10.99 years. The average duration of illness was 9.09 ± 6.66 years. The average duration of schooling was 11.06 ± 4.73 years. Longer duration of schooling was correlated with higher scores ($r = 0.52, p \leq 0.001$). However, neither age ($r = 0.17, p = 0.22$), nor duration of illness ($r = 0.20, p = 0.37$) had correlation with the scores. Only 26.4% of the patients knew the cause of epilepsy, and 7.5% knew the law pertaining to driving. The average score was 6.15 ± 2.02 .

Conclusion: Epilepsy patients' knowledge of their disorder in Medan was poor. Higher scores were seen in patients with longer duration of education.

42. Magnetic resonance imaging findings in patients undergoing pre-operative evaluation for epilepsy surgery.

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Background: Locally between 27% to 40% of patients with epilepsy attending neurological clinics are refractory to drug therapy. Magnetic resonance imaging (MRI) was performed as part of the pre-operative assessment in order to determine the epileptogenic substrate in this group of patients. In cases where clinical, psychological, electro-encephalographic and imaging data are concordant, surgery is an established treatment. *Methods:* Consecutive adult patients with clinical evidence of chronic epilepsy refractory to medical treatment underwent pre-surgical evaluation between 1996 and 2000. MRI protocol consisted of axial T1- and T2-weighted axial images, oblique coronal T1- and T2-weighted images using a 1.5 Tesla Philips MR scanner. Video-monitoring and scalp EEG studies but invasive EEGs were not performed. *Results:* 100 patients were investigated – 45 males and 55 females. Mean ages at the time of scanning were 33 years of age (range 15 to 50 years). The diagnostic yield was 72%. The most common pathology seen on MRI was hippocampal sclerosis in 30 patients – bilateral in three. Low grade tumours were found in five cases (temporal in three cases; dysembryoblastic neuroepithelial tumours was the most common type of tumour overall), six had vascular abnormalities and seven had cortical dysplasia. 23 patients had other non-discrete lesions such as ischaemia, post-encephalitic encephalomalacia and arachnoid cysts. 22 patients with circumscribed lesions were considered suitable for surgery; of these, 18 have been operated on, two are awaiting surgery and another two have refused surgery.

Conclusion: Hippocampal sclerosis is the most common abnormality found in this Chinese series. With non-invasive EEG monitoring, 54% (20/37) of patients with a single temporal lesion were suitable candidates for surgery whereas the figure was only 6% (2/35) in those with extratemporal or diffuse pathology.

43. Selective Amygdalo-hippocampectomy for Epilepsy: Results from 15 cases

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15 patients with classic unilateral mesial temporal lobe epilepsy underwent selective trans-sulcal amygdalo-hippocampectomy using frameless stereotaxy guidance by the author from 1998 to the present. There were 10 males and 5 females and their ages ranged from 12 to 43 years. The surgery was left-sided in 7 and right-sided in 8. All patients were right-handed except for 1. A small oval keyhole craniotomy (approximately 4 cm diameter) centered on the superior temporal sulcus was used in all cases. The hippocampus was removed microsurgically to the level of the tectal plate posteriorly in all cases aided by use of the ultrasonic aspirator. The lateral temporal lobe was preserved in all cases. There was no mortality in all 15 cases. All patients had an Engel's Class I outcome (but 1 patient required repeat surgery to excise more hippocampus to achieve this). One patient had transient upper limb weakness 2 days after surgery but this recovered fully to normal in a few weeks. Average hospital stay was 4 days using this minimally invasive neurosurgical approach. Post-op MRI showed satisfactory excision of the hippocampus in most cases.

Infections of the Central Nervous System (44-62)

44. Treatment of acute Nipah encephalitis with ribavirin

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Background & Objective: Nipah virus, a newly identified paramyxovirus was responsible for a severe outbreak of encephalitis in Malaysia between September 1998 and June 1999 involving 265 cases with 105 fatalities. We report an observational study on the therapeutic trial of oral and intravenous ribavirin in acute Nipah encephalitis at two major centres involved in the management of patients during the outbreak. *Method:* Ribavirin was provided for open-label treatment to 140 patients who had Nipah encephalitis. 54 patients who were not treated either because they refused treatment or were managed prior to the availability of ribavirin were taken as control. *Result:* There were 74 deaths in both groups, an overall mortality of 37.5%. There were 45 deaths (32%) in the ribavirin arm while 29 deaths (54%) occurred in the control arm, which represents a 36% reduction in mortality. Ribavirin and younger age were independently associated with a better outcome ($p=0.011$ and $p=0.024$ respectively) on Cox regression analysis. Ribavirin was not significantly associated with serious side effects such as anaemia and jaundice.

Conclusion: This study showed that ribavirin was associated with reduced mortality in acute Nipah encephalitis.

45. Exposure and severity of disease in acute Nipah encephalitis

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Background & Objective: The Nipah encephalitis outbreak in Malaysia in 1998/1999 affected 256 pig farm industry workers, claimed 105 lives and devastated the biggest pig farm industry in South East Asia. Epidemiology studies suggested that close contact with sick animals was strongly associated with infection. However, the association between the level of exposure and the severity and outcome of the illness is not known. We studied the correlation between occupation and outcome of the 194 patients who were admitted into University of Malaya Medical Centre and Seremban Hospital. *Method:* 194 patients admitted into the University Malaya Medical Centre or Seremban Hospital who had clinical, cerebrospinal fluid or magnetic resonance imaging evidence of encephalitis, came from the outbreak area during the outbreak were studied. The pig farm owners and workers were classified as having high exposure risk, while those involved in transportation, the abattoir workers, the cullers and other as low exposure risk. The primary outcome measure was mortality, and secondary measures include the need of mechanical ventilatory support, the length of hospital stay, residual neurological deficits on follow up, and the risk of relapse. *Result:* There were altogether 194 patients, 155 in the high exposure group and 39 in the low exposure group. There was no difference in the demography of the two groups. There was also no significant difference between the two exposure groups in all the outcome measures, including mortality (40.0% versus 30.8%, $p=0.38$), proportion being ventilated (58.4% versus 48.7%, $p=0.36$), duration of hospital stay (median 10 days versus 9 days, $p=0.19$), proportion with residual neurological deficits (5.08% versus 11.4%, $p>0.99$) and proportion with relapse encephalitis (4.02% versus 0%, $p=0.60$).

Conclusion: The level of exposure did not affect the outcome of acute Nipah encephalitis.

46. Diabetes mellitus and acute Nipah encephalitis

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Background & Objective: The outbreak of Nipah encephalitis in 1998/1999 claimed 105 lives, affected 256 patients and decimated the largest pig farm industry in South East Asia. Previous studies have shown that brainstem involvement and dysautonomia predict poorer outcome. It is not known if any host factor influences the outcome. Diabetes mellitus causes some degree of immunoparesis. We compared the clinical manifestations, laboratory findings and outcomes of diabetic patients to assess if diabetes mellitus affects outcome in Nipah encephalitis. *Method:* 194 patients admitted into the University of Malaya Medical Centre or Seremban Hospital who had clinical, cerebrospinal fluid or magnetic resonance imaging evidence of encephalitis, came from the outbreak area during the outbreak were studied. The primary outcome measure was mortality, and secondary measures include the need of mechanical ventilatory support, the length of hospital stay, residual neurological deficits on follow up, and the risk of relapse. We also compared various clinical and laboratory parameters between the diabetic (n=10) and the non-diabetic (n=184) patients. *Results:* The diabetic patients were older (age 50.8 ± 4.24 versus 37.1 ± 12.4 years, $p=0.00064$), had higher blood pressure on admission (systolic 152 ± 33.1 versus 131 ± 17.9 mmHg, $p=0.00065$, diastolic 88.9 ± 18.3 versus 79.5 ± 13.7 , $p=0.039$) and at nadir (systolic 209 ± 33.9 versus 164 ± 31.6 mmHg, $p=0.000026$, diastolic 120 ± 25.6 versus 93.8 ± 17.1 , $p=0.000009$) and higher temperature at nadir (40.4 ± 0.817 °C versus 39.3 ± 1.19 °C, $p=0.0035$). They also had higher peak serum (18.1 ± 6.27 mmol/l versus 11.1 ± 5.08 , $p=0.0015$) and CSF sugar (5.9 ± 1.6 mmol/l versus 4.3 ± 3.0 , $p=0.0017$) and peak serum creatinine (264 ± 231 mol/l versus 134 ± 123 , $p=0.017$). There was no difference in all other parameters, including gender, proportion of Chinese, clinical history, other examination and laboratory findings. The diabetic patients had a 80% mortality, compared with 35.9% in the non-diabetic patients. This translates to a relative risk of 2.23 (95% CI 1.55-3.21, $p=0.0074$) or a 123% increase in mortality. Diabetes mellitus, however, has no influence on the need of mechanical ventilation (80% versus 54.9% $p=0.19$), the length of hospital stay (38.4 ± 95.8 days versus 18.8 ± 33.5 days, $p=0.17$), the proportion with residual neurological deficits (0% versus 12.5%, $p=0.61$) as well as relapse encephalitis (0% versus 3.26%, $p>0.99$). On logistic regression analysis, both the admission systolic blood pressure and the past history of diabetes mellitus were statistically significant as predictors of death ($p=0.013$ and 0.037 respectively).

Conclusion: We concluded that host immune factor is important in determining the outcome of acute Nipah encephalitis, in particular, patients with mild immunoparesis caused by diabetes mellitus has a 123% increase in mortality.

47. Patients with asymptomatic Nipah virus infection may have abnormal cerebral MR imaging

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Background: An outbreak of severe encephalitis occurred in Malaysia among the pig farmers from September 1998 to April 1999. It was due to a newly discovered paramyxovirus, Nipah virus. Epidemiological studies showed that up to 11% of the household members of the infected farms had asymptomatic infection. *Objectives:* To determine the presence of cerebral MR imaging abnormalities in subjects with asymptomatic Nipah virus infection and to correlate the MR imaging abnormalities with degree of exposure to sick animals. *Methods:* MR imaging of the brain with spin-echo T1- and T2-weighted sequences and T2-weighted fluid attenuated inversion recovery (FLAIR) sequences were performed on the subjects with asymptomatic infection. *Results:* Thirty-two subjects were

studied. MR imaging abnormalities were detected in 5 subjects (16%), one of whom was a nurse who worked with the patients with acute Nipah encephalitis during the outbreak and was not exposed to sick animals. The abnormalities consisted of multiple, discrete, small high signal lesions seen in the subcortical and deep white matter of the cerebral hemispheres, best seen on the FLAIR images. There was no correlation in the degree of exposure to sick animals between the 5 subjects with abnormal brain imaging and 10 age and sex matched controls with positive anti-Nipah antibody and normal cerebral MR imaging. No progression of the lesions was seen in the follow-up scan in one subject. The subjects remained well 20 months after the initial outbreak.

Conclusion: Abnormal cerebral MR imaging was seen in 16% of subjects with asymptomatic Nipah virus infection. One of the subjects with abnormal cerebral MR imaging was a nurse, indicative of human-to-human transmission.

48. Meningoencephalomyeloradiculopathy associated with Japanese encephalitis virus: A case report with clinical, electrophysiological and neuroradiological correlation.

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Japanese encephalitis virus (JEV) infection usually presents as meningoencephalitis. Involvement of the spinal cord and nerve roots are rarely seen. We report a case of meningoencephalomyeloradiculopathy associated with JEV infection with clinical, electrophysiological and neuroradiological correlation. A 25-year-old Thai male presented with fever, headache, rapidly progressive paraparesis and became confused on the seventh day of the illness. CT scan of the brain showed generalized edema. CSF examination showed mononuclear cell pleocytosis. Three days later, he developed respiratory failure and was intubated and referred to Ramathibodi Hospital. On physical examination, he could follow simple commands. There were neck stiffness, bilateral LMN facial weakness, severe paraparesis and total areflexia. Nerve conduction study showed small amplitude of compound muscle action potentials, absence of F-waves and normal sensory conduction. The MRI showed high signal T2-weighted change at both thalami, internal capsules, basal ganglia, midbrain, pons, cerebellum and temporal cortices with minimal leptomeningeal enhancement and intradural tubular enhancement along the cervical canal, conus medullaris and cauda equina. CSF showed high titer for JEV IgM antibody. He gradually got better and on discharge six weeks later, the facial weakness was improved but the paraparesis remained the same. Four months later, there was only minimal facial weakness but the leg muscles were still very weak and wasted. We postulated that the pathophysiology in this case was direct viral invasion to anterior horn cells as evidenced by the clinical features and electrophysiological study and immunological process as suggested by marked improvement of the facial weakness. The MRI findings are remarkable and confirmed multiple nerve root involvement.

49. Computerized tomography and magnetic resonance imaging in Japanese encephalitis in Vietnamese adults

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Background: Japanese encephalitis (JE) has high mortality and severe sequelae. In Northern Vietnam, JE in children is an endemic/epidemic disease. Outbreaks often occur in the summer. However, in recent years, many sporadic JE cases have been observed in adults. *Objective:* To describe CT and MRI findings in adult patients with JE. *Methods:* All adult patients admitted to the Neurology Department of Bach Mai Hospital with JE in 1998 were screened by MAC-ELISA test. In addition to neurological and laboratory examinations, CT Scan of the brain was performed in 30 patients and MRI of the brain in three patients. *Results:* There were 30 adult patients diagnosed as JE based on a positive MAC-ELISA test. JE occurred sporadically and accounted for 26% of the

acute encephalitis syndrome. Clinical course was mostly subacute and the mortality rate was low (7%). CT Scan and MRI findings were non-specific with hypodense areas of two centimeters in diameter in various areas over both cerebral hemispheres. MRI revealed more lesions including in areas which were not well visualised on CT (i.e. brainstem, cerebellum, thalamus), as well as demonstrating lesions under 10 mm of diameter.

Conclusion: Non-specific abnormalities were seen in brain CT and MRI in adult JE.

50. Encephalitis lethargica in two patients with bilateral substantia nigra lesions on MRI scan

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We present two cases of Encephalitis Lethargica seen in our institution with interesting MRI findings. The first case was a 33-year-old woman who was admitted for meningoencephalitis and developed ophthalmoplegia, akinetic mutism and prominent extrapyramidal signs of lip and hand tremors, cogwheel rigidity and facial bradykinesia about 3 days into her illness. The second case involved a 38-year-old woman with fever and headache for 2 weeks and developed increasing somnolence, akinetic mutism and extrapyramidal signs of hand tremors, cogwheel rigidity, bradykinesia and later on akathisia. In both patients, the diagnosis of encephalitis lethargica was established according to the criteria proposed by Howard and Lees. MRI brain of both patients showed leptomeningeal enhancement and increased signal at bilateral substantia nigra on T2 scans. Both patients were treated with Madopar and Bromocriptine and they made full recovery after three months.

51. Characteristics of subacute sclerosing panencephalitis

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Background: Subacute sclerosing panencephalitis (SSPE) is a progressive fatal disorder caused by persistent measles virus. SSPE usually presents with mental deterioration and myoclonic jerks. The diagnosis is based on clinical findings, EEG and titre of measles antibodies in the CSF. *Objective:* To study the clinical pattern of SSPE. *Methods:* We retrospectively studied patients diagnosed to have SSPE admitted to the neurology ward of the Hasan Sadikin General Hospital, Bandung, from 1994 to 2000. Clinical and laboratory findings were reviewed. *Results:* There were 16 patients with the final diagnosis of SSPE, aged 9 to 22 years, 9 male and 7 female. The most prominent signs and symptoms were mental deterioration and myoclonus. Thirteen cases (81%) had no prior measles immunisation. Nine cases (56%) had antecedent natural measles infection, while 5 (31%) had no history of measles infection. EEG showed periodic complexes in 10 cases (62%). Serum and CSF titres of measles antibody were examined in 14 patients and all were positive.

Conclusion: The most prominent signs and symptoms of SSPE were mental deterioration and myoclonus. Most of the case occurred in patient without history of measles immunisation and in those who had prior natural measles infection

52. Frequency of hearing loss in pediatric patients afflicted with bacterial meningitis: A five-year review (January 1995 – July 2000)

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Background & Objective: Meningitis commonly affects children and hearing loss is one of its most serious sequelae. The incidence of post-meningitic hearing loss in children range from 5-30%. It is the objective of this paper to determine the frequency of hearing loss in pediatric patients as sequelae of previously treated acute bacterial and tuberculous meningitis using the transient evoked otoacoustic emission test. *Method:* A retrospective-prospective study was done to examine cases of acute bacterial and tuberculous meningitis in children of both sexes admitted at Santo Tomas University Hospital-Clinical Division from January 1995 – July 2000. Hearing loss was confirmed by a transient evoked otoacoustic emission (TEOE) test. *Result:* Ninety-three patients comprised the test subjects, seventeen of whom had hearing loss (18.3%). Among those afflicted with tuberculous meningitis, 9.5% had hearing loss while 21% of those who had acute bacterial meningitis acquired this complication.

Conclusion: Hearing impairment is common after bacterial meningitis and less so with tuberculous meningitis.

53. Adult community acquired bacterial meningitis admitted to a teaching hospital in Singapore between 1993-2000

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Objective: To describe the pattern of community acquired bacterial meningitis in adults admitted into a Singapore tertiary-care hospital. *Method:* Case notes of all patients admitted between 1993 and 2000 with meningitis/meningoencephalitis were retrospectively reviewed. "Culture positive" meningitis has compatible clinical pictures and either positive cerebrospinal fluid (CSF) cultures or CSF pleocytosis accompanied by positive CSF bacterial antigen coagglutination or positive blood cultures. Cases with compatible clinical pictures, CSF pleocytosis of at least 100 neutrophils per μL but negative cultures were included as "culture negative" cases. Patients less than 14 years old and those with traumatic skull fractures, post neurosurgery or indwelling intracranial devices were excluded. *Results:* Twenty-nine cases of bacterial meningitis, 16 "culture-positive" and 13 "culture-negative" were identified. There were 5 cases of *Streptococcus pneumoniae*, 3 *Streptococcus agalactiae* (Group B *Streptococcus*), 3 *Neisseria meningitidis*, 2 each of *Listeria monocytogenes* and *Klebsiella pneumoniae* in addition to 1 case of *Streptococcus suis*. All 3 cases of *S. agalactiae* occurred in the year 1998 and both *Listeria* cases occurred in the year 2000. One case of *S. pneumoniae* meningitis was penicillin-resistant. Neutrophil- predominant pleocytosis was seen in most culture positive cases. One case of *S. agalactiae* and both cases of *L. monocytogenes* had lymphocyte-predominant pleocytosis.

Conclusions: Nearly half of community acquired adult bacterial meningitis is "culture negative". *S. pneumoniae* is the most important cause of bacterial meningitis in adults in Singapore. The clustering of Group B streptococci cases in the year 1998 was also reported in another Singaporean and Hong Kong hospital and suggests the presence of an outbreak. Penicillin-resistant *S. pneumoniae* had been previously noted but fortunately remains uncommon. The occurrence of 2 cases of *Listeria* in 2000 should alert local physicians to be vigilant for further cases.

54. Adult acute bacterial meningitis in Singapore 1993-2000: A review of cases from two teaching hospitals

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Objective: To review the pattern of acute bacterial meningitis in adults admitted to two Singapore teaching hospitals. *Method:* Case notes of all patients admitted to Singapore General Hospital and the National University Hospital between 1993 and 2000 with acute bacterial meningitis were reviewed. Acute bacterial meningitis was divided into “culture positive” or “culture negative”. Inclusion criteria for acute bacterial meningitis were CSF neutrophilia of $>100/\mu\text{L}$, and positive blood or CSF cultures. Patients less than 14 years old, with skull or intracranial manipulation were excluded. *Results:* Seventy-two cases of bacterial meningitis, 43 “culture-positive” and 29 “culture-negative” were identified. There were 14 cases of *Streptococcus pneumoniae*, 12 *Streptococcus agalactiae* (Group B *Streptococcus*), 4 *Klebsiella pneumoniae*, 3 alpha hemolytic streptococcus, 3 *Neisseria meningitidis*, 2 *Listeria monocytogenes* and *Staphylococcus aureus* in addition to 1 case each of *Streptococcus suis*, *Salmonella* and *Melioidosis*. All 14 cases of *S. agalactiae* occurred in the years 1998/9 and both *Listeria* cases occurred in the year 2000. One case of *S. pneumoniae* meningitis was penicillin-resistant. Neutrophil-predominant pleocytosis was seen in most culture positive cases. Two cases of *S. agalactiae* and both cases of *L. monocytogenes* had lymphocyte-predominant pleocytosis.

Conclusions: *Streptococcus agalactiae* (Group B *Streptococcus*) was the most commonly encountered pathogen but was restricted to 1998/9, confirming an outbreak occurred in Singapore during that period. *Streptococcus pneumoniae* is the most consistent cause of acute bacterial meningitis in adults in Singapore. Penicillin-resistant *Streptococcus pneumoniae* was seen once. Meningococcus is encountered much less frequently than reported in the literature. The occurrence of 2 cases of *Listeria* in 2000 should alert local physicians to be vigilant for further cases.

55. Penicillin-resistant pneumococcal meningitis in National University Hospital, Singapore

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In line with worldwide trends, Singapore has reported an increase in infections caused by penicillin-resistant *Streptococcus pneumoniae* (PRSP) from 0.5% in 1977-1986 to 21-25% by the mid-1990's. To date, there has been no published data on PRSP meningitis in Singapore. We report 2 cases of PRSP meningitis in the National University Hospital Singapore. *Case Reports:* A 46 year-old lady was admitted with headache, fever, neck stiffness and confusion. Her CT brain showed sinusitis. The cerebrospinal fluid (CSF) results were consistent with bacterial meningitis. She remained ill despite central nervous system doses of intravenous ceftriaxone and was commenced on intravenous vancomycin and oral rifampicin for a total of 2 weeks. Multi-resistant *Streptococcus pneumoniae* with an intermediate sensitivity to penicillin and ceftriaxone (MIC 1.5 and $0.75\mu\text{g/ml}$ respectively) was isolated from the CSF. With the vancomycin, rifampicin and a sinus drainage, she improved dramatically and was discharged well. The second case, a 4 year-old boy, had fever with seizures, neck stiffness and drowsiness. His CSF coagglutination test was positive for *Streptococcus pneumoniae*. He was started on intravenous ceftriaxone but did not improve. Intravenous vancomycin was added, followed by oral rifampicin. Multiresistant *Streptococcus pneumoniae* was later isolated from both the CSF and blood. This was resistant to penicillin (MIC $1.5\mu\text{g/ml}$) and intermediately sensitive to ceftriaxone (MIC $0.75\mu\text{g/ml}$). He made a slow recovery and had permanent sequelae of cognitive impairment, spastic-dystonic hemiplegia and a communicating hydrocephalus.

Conclusion: Based on the increasing prevalence of PRSP and the often grave outcome of pneumococcal meningitis especially in children, we recommend a combination of intravenous vancomycin and a cephalosporin as empirical treatment for this disease until the bacteriological susceptibility results are available. The patient may then remain on high doses of cephalosporins alone if the MIC for the cephalosporin is $<0.5\mu\text{g/ml}$. The patient's clinical and laboratory status must be closely monitored for complications of this potentially fatal illness.

56. A case report of tetanus without trismus

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Background: The first clinical symptom of tetanus is usually trismus (lockjaw), or inability to open the mouth due to stiffness or spasticity of the masseters. Since January 1st 1991 to December 31st 2000, there has been 507 cases of tetanus seen at our department, including 30 cases reported by Ariyanti (1991), 110 cases by Suparman (1998), 81 cases by Polhaupessy (1999), and all of them had trismus. We report a case of tetanus without trismus. *Case report:* A 25 year-old male came to Hasan Sadikin Hospital, Bandung, with symptoms of spasticity and pain on his left leg starting seven days before hospitalisation. The symptoms progressed to affect both legs, abdominal and there was excessive sweating. There was no difficulty in opening his mouth and no spasm of the jaw muscles. Fourteen days before hospitalization, the patient had suffered a puncture on the sole of his left foot by snail shell and the wound was untreated. On physical examination, there was rigidity of the abdomen, opisthotonus, spasticity of both lower extremities, and hyperhidrosis but no trismus. Laboratory, radiology, and ECG examinations were normal. Diagnosis was based on Patel-Joag criteria and Ablett's (Udwadia modification). During hospitalization, the patient was treated with ATS, TT, tetracyclin, metronidazole, diazepam, and left the hospital with improvement.

Conclusion: Tetanus without trismus may rarely be seen.

57. Validity of first diagnosis compared to final diagnosis of tuberculous meningitis

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Background and Objective: Clinical symptoms of tuberculous meningitis (TBM) are often obscure and cause difficulties in diagnosis and treatment and thereby high morbidity and mortality rates. The aim of this study is to evaluate the validity of first diagnosis criteria used in the Department of Neurology of Hasan Sadikin General Hospital Bandung. *Methods:* This is a cross sectional study carried out on 41 TBM patients admitted to the Department of Neurology, Hasan Sadikin General Hospital Bandung, from 1st January 1998 to 31st December 1998. The initial diagnosis was compared to the final diagnosis made for the patients. The criteria of the first diagnosis were based on clinical presentation, cerebrospinal fluid examination, chest X ray, tuberculin test, erythrocyte sedimentation rate, eye examination for choroidal tubercles. Polymerase chain reaction, possibility of hyponatremia, therapeutic response to antituberculous drugs, extrapulmonary foci, cultures, were added criteria when making the final diagnosis. Analysis of sensitivity, specificity and accuracy were carried out using statistical methods of McNemar Chi-Square & Wilcoxon tests. *Results:* The first diagnosis criteria compared to final diagnosis has a sensitivity of 100 %, specificity of 66.7 % and accuracy 97.5 % (X M-N = 0 , p = 1.0).

Conclusion: Criteria for the first (initial) diagnosis of TBM used by the Department of Neurology, were found to be reliable.

58. Correlation between Ogawa Diagnostic Criteria with polymerase chain reaction in tuberculous meningitis

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Background: Definite diagnosis of tuberculous meningitis (TBM) depends on the demonstration of tubercle bacilli in cerebrospinal fluid (CSF), by positive culture in CSF or positive PCR. Early diagnosis and treatment of TBM is important for a favorable outcome. *Objective:* To assess correlation between Ogawa diagnostic criteria with PCR result. *Methods:* The study was performed prospectively on clinical and laboratory data of 24 TBM patients diagnosed with Ogawa Criteria. All patients were hospitalized at the Neurological Department, Hasan Sadikin General Hospital, between April 1st 2000 - November 30th 2000. For the detection of mycobacterium tuberculosis, DNA in CSF was detected using PCR with primers MPB 64. The test was done at Microbiology laboratory, Cipaganti Pulmonary Hospital, Bandung. *Result:* All the 3 patients with Ogawa 4 criteria had positive PCR (100%), 90% of the 15 patients with Ogawa 3 criteria had positive PCR, 83% of the 6 patients with Ogawa 2 criteria had positive PCR.

Conclusions: Ogawa criteria correlated well with PCR examination. Patients with more Ogawa criteria had higher rate of positive PCR, however, this was not statistically significant.

59. Polymerase chain reaction in tuberculous meningitis

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Background: Definite diagnosis of tuberculous meningitis (TBM) is based on a positive culture or smear in cerebrospinal fluid (CSF). Polymerase chain reaction (PCR) is a modern diagnostic technique offering more rapid diagnosis with higher sensitivity. *Objective:* To assess the validity of PCR in the diagnosis of TBM. *Method:* Prospective analysis on 24 patients with TBM according Ogawa criteria (1987) and 19 controls who had non-tuberculous CNS infections. The patients and controls were from the Neurology Department, Hasan Sadikin General Hospital, Bandung, between April 1st 2000 and November 30th 2000 (8 months). PCR with primers for MPB 64 was used to detect M. tuberculosis DNA in CSF. The test was done at the microbiology laboratory, Cipaganti Pulmonary Hospital, Bandung. *Results:* During the study period, 24 patients fulfilled the criteria for diagnosis of TBM, 16 patients (67%) were diagnosed as definite TBM (culture positive) and 8 patients (33%) as probable TBM. PCR for M. tuberculosis was positive in 22/24 (92%) of the TBM patients. The PCR was positive in 15/16 (94%) patients with definite TBM and 7/8 patients (88%) with probable TBM. Among the controls, PCR was positive in 2/19 patients (11%). TB culture was positive in 16/24 patients (67%) with TBM and Ziehl-Nielsen (Z-N) staining was positive in 5/24 patients (21%). None of the patients in the control group had positive culture or Z-N staining.

Conclusion: The sensitivity of PCR is 92% and specificity 90% for the diagnosis of TBM. PCR is a useful method for diagnosis of TBM.

60. Aspergillosis of the central nervous system: A catastrophic opportunistic infection

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Background: Aspergillosis of the central nervous system is a rare disease and a catastrophic condition. It occurs most frequently in the setting of an immunocompromised host. Previously, there was only one report of 3 cases of cerebral aspergillosis in Thai patients.

Objective: To describe the clinical features and outcome of treatment of CNS aspergillosis in Thai patients. *Method:* The patients who were diagnosed as CNS aspergillosis were retrospectively reviewed from medical records from January 1, 1991 to December 31, 2000. The study variables included age, sex, underlying diseases, symptoms and signs, neuro-imaging study, pathology and outcome of treatment. *Results:* There were seven cases of aspergillosis of the central nervous system. Four patients were male. The median age was 65 years (range 36-78 years). The most common underlying disease was diabetes mellitus (4/7; 57%). Two patients (29%) had no underlying disease. The most common primary site of infection was paranasal sinus (6/7; 86%). The most common clinical presentation was headache (6/7; 86%). Common neurological signs included multiple cranial nerve palsies (5/7; 71%) and alteration of consciousness (3/7; 43%). The median duration of the symptoms prior to admission was 60 days (range 8 - 180 days). All patients were treated with intravenous antifungal agents with high cumulative dose. Extensive surgery was performed in 6 patients. The mortality rate was high (6/7, 86%).

Conclusion: Aspergillosis of the CNS should be considered especially in the elderly and diabetic patients with clinical features of headache, multiple cranial nerve palsies and alteration of consciousness accompanied by sinusitis. It remains a catastrophic opportunistic infection in spite of the current intensive and aggressive treatment.

61. Persistently low cerebrospinal fluid glucose in a case of cured cryptococcal meningitis

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Background: Cryptococcal meningitis is a common central nervous system infection in Asia and cerebrospinal fluid (CSF) glucose level is used to monitor the response to treatment. We describe a case of cured cryptococcal meningitis where the CSF glucose remained persistently low. *Case Report:* A 59 year old man, previously well, presented with a one month history of worsening occipital headache, diplopia, deteriorating vision and hearing loss. Clinical examination revealed nystagmus on left lateral gaze and left sided cerebellar signs. Lumbar puncture showed high CSF pressure, elevated protein, low glucose (1.3 mmol/l) and pleocytosis. Both cryptococcal antigen and Indian ink stain was positive. He was treated with Amphotericin B with a cumulative dose of 3 g, in addition to fluconazole. CSF culture was negative at the end of the 3 months treatment but showed low glucose (1.5 mmol/l). Several samples obtained at regular intervals on an outpatient basis showed CSF glucose ranging from 0.7-1.8 mmol/l but negative cultures for cryptococcus neoformans. All blood glucose samples were within normal limits. The CSF glucose subsequently normalized 9 months after completion of treatment. This persistently low CSF glucose is contrary to the currently held opinion that in treated cryptococcal meningitis, glucose level is a sensitive indicator of response to treatment. A probable explanation to this phenomenon is the delayed recovery of the energy dependent glucose-carrier transport system between CSF and blood.

Conclusion: A case of cryptococcal meningitis is reported whereby low CSF glucose persisted for up to 9 months after curative treatment.

62. Cerebral cysticercosis in Vietnam – A review of 225 cases

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Background & Objective: Cysticercosis is an endemic parasitosis in many parts of the world, especially in many developing countries. Cerebral cysticercosis is the most common parasitic disease of the central nervous system. In Vietnam, this disorder constitutes an important problem in daily practice since it can mimic many different neurological syndromes. The aim of this study is to report clinical manifestations, laboratory findings and management of cerebral cysticercosis in Vietnam.

Method: Medical records of patients suffering from cerebral cysticercosis admitted to 2 central services of neurology in Hanoi were analysed. The diagnosis was based on the clinical symptoms, biopsy of subcutaneous nodules or involved muscles, CT or MRI findings, serum and CSF serology.

Results: In the 10 years period from 1991 to 2000, 225 patients were admitted to 2 central departments of neurology in Hanoi. They come from all the provinces in North Vietnam. 180 patients (80%) were from rural areas. 149 (66%) were male and 76 (34%) were female. Clinical symptoms consisted of headache (85%), insomnia (80%), seizures (60%), raised intracranial pressure (56%), sensory symptoms (25%), motor deficits (8%), meningoencephalitis (8%), and isolated cranial nerve palsies (3%). Brain CT scan showed that most of the patients had concurrently four stages of natural course of parenchymal brain cysticerci and they resided in the different anatomic parts of the brain. They were most often found in cerebral hemispheres (100%), cerebellum (14%), brainstem (9%), subarachnoid space and ventricles (8%). Patients were treated by praziquantel at the dose of 30mg/kg/day in three-divided dose for 10 days. Three courses were given at the interval of 20 days. Corticosteroids and the other drugs were used to ameliorate side effects. All patients improved with the treatment. No active stage cysticerci were seen on CT scan.

Conclusions: Cysticercosis is an endemic parasitosis in Vietnam. CT plays an important role in the diagnosis cerebral cysticercosis. Praziquantel is an effective treatment.

Neuromuscular diseases (63-74)**63. Delayed post-radiation bulbar palsy among patients with nasopharyngeal carcinoma**

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Background: Delayed post-radiation bulbar palsy is a known but scarcely reported complication of radiotherapy in nasopharyngeal carcinoma (NPC). *Objectives:* To determine the prevalence, clinical features and predisposing factors of post-radiation bulbar palsy. *Methods:* This is a cross-sectional study of patients attending NPC Clinic in University Malaya Medical Centre. From August 1998 to February 2000, 70 randomly selected patients who had received 70 Gy to the primary tumor and 60 Gy to the neck underwent clinical examination and screening electromyography (EMG). Those who had bulbar palsy underwent further studies with EMG and MRI. Patient with tumor was excluded from the study. *Results:* Prevalence of post-radiation bulbar palsy was 20% (14 patients), affecting the 8th, 9th, 10th, 11th and 12th cranial nerves and fifth cervical cord segment. Age of onset was 51 years (range 34-58 years). The duration after radiotherapy was 5.5 years (range 1-18 years). Disability was moderate to severe, resulting in three cases of aspiration pneumonia and one death during the study period. A second course of radiotherapy was a predisposing factor ($p < 0.001$) but not age during radiotherapy, sex, hypertension and previous chemotherapy. EMG studies showed neurogenic process. Of the 13 patients who had brain and cervical MRI, only one patient showed radiation changes in temporal lobes and pons.

Conclusion: Post-radiation bulbar palsy is a common delayed complication among NPC patients with significant morbidity and mortality. There appears to be a dose-dependent effect.

64. Peripheral neuropathy in anti HIV-positive patients in Chiang Mai University, Thailand

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Objective: To characterize peripheral neuropathy in anti HIV-positive patients in Chiang Mai University, Thailand. *Methods:* Thirty-three anti HIV-positive patients were examined in electrophysiologic laboratory in Chiang Mai University, Thailand. The studies included nerve conduction studies, H reflex, F response and skin sympathetic response (SSR). *Results:* The neurological symptoms of anti HIV-positive patients were weakness, numbness, dysaesthesia and bowel-bladder abnormalities. Electrophysiologic studies revealed polyradiculopathy in 30 patients (91%), sensorimotor polyneuropathy in 29 patients (85%), demyelinating polyneuropathy in 19 patients (58%), axonopathy polyneuropathy in 17 patients (52%), small fiber neuropathy in 11 patients (33%), pure sensory polyneuropathy in 4 patients (12.1%), polyneuropathy in 2 patients (6.0%), pure motor polyneuropathy in 1 patient (3%) radiculopathy in 1 patient (3%) and mononeuropathy in 1 patient (3%).

Conclusion: The electrophysiologic studies in anti HIV-positive patients showed both large fiber neuropathy and small fiber neuropathy. Most common types of peripheral neuropathy were polyradiculopathy (91%) and sensori-motor polyneuropathy (85%). Small fiber neuropathy were also found in about 33% of the cases.

65. Brachial amyotrophic diplegia: A report of 2 cases

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We report two cases of brachial amyotrophic diplegia, a sporadic form of motor neuron disorder with weakness largely confined to the upper extremities over time. *Case report:* The first case is a 31 years old Indonesian male with progressive bilateral upper limb weakness for 2 years, despite previous laminectomy for presumed C5-6 prolapsed intervertebral disc. The second case is a 68 years old Malay male with progressive bilateral upper limb weakness over 1 year, and was treated previously by the primary physician as bilateral frozen shoulder. Both cases showed striking similarity with severe atrophy and weakness of both upper extremities, sparing the lower extremity, respiratory and bulbar musculature. Sensation was normal with absent reflexes in the upper limbs and normal reflexes in the lower limbs. MRI of the cervical spine for both cases were unremarkable. Electrophysiological findings were consistent with an anterior horn cell disorder. In the first case, there were denervation changes confined mainly in the upper extremities while the second case showed a more widespread distribution of denervation.

66. Direct facial nerve and blink reflex studies in diabetes mellitus

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Objectives: The goal of this study is to investigate the prevalence rate and identify electrophysiologic abnormalities involving cranial nerves among diabetics using the direct facial nerve response and the blink reflex. This study also aims to correlate the frequency of cranial neuropathy with polyneuropathy and carpal tunnel syndrome. *Methods:* Subjects consisted of 58 consecutive patients with diabetes seen in a private clinic in a tertiary hospital. They were subjected to electrophysiologic studies to determine the existence of polyneuropathy and carpal tunnel syndrome. Direct facial nerve and blink reflex studies were then performed. Findings for direct facial nerve response and blink reflex were compared to normative data using unpaired t-test. Chi-square was done to correlate the frequencies of cranial neuropathy, polyneuropathy and carpal tunnel syndrome.

Results: The mean latencies of R1, R1K, ipsilateral and contralateral R2 were increased while the R1-Contralateral R2 and the R over direct facial nerve stimulation amplitude ratio were decreased among diabetics. There was no significant difference among the frequencies of cranial neuropathies, polyneuropathies and carpal tunnel syndrome.

Conclusion: The study provides evidence that there is no correlation among the frequencies of mononeuropathies and polyneuropathies, which may signify difference in the pathophysiology of these disease entities.

67. The clinical spectrum of chronic inflammatory demyelinating polyneuropathy at the University Hospital, Kuala Lumpur

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Introduction: Although Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) is classically a symmetrical predominantly motor polyneuropathy with both proximal and distal weakness and a chronic progressive or relapsing course; some acquired demyelinating polyneuropathies may not fit this clinical picture but may respond to immunomodulatory therapy. *Objective:* To review clinical spectrum of patients diagnosed to have CIDP, seen at the University Malaya Medical Centre, their treatment and assess their functional status on follow up. *Methods:* Clinical data of CIDP patients

seen at the Neurology Clinic, UHKL were reviewed. Criteria for inclusion were clinical features of chronic progressive neuropathy, electrophysiological features of demyelination and the exclusion of other causes of chronic polyneuropathy. Functional status was assessed using a scale adapted for chronic neuropathy. (Nobile-Orazio et al, 1993). *Results:* There were 21 patients with a mean age at presentation of 46 years (range 13 to 89 years). 10 (48%) were men and 11 (52%) women. 16 (76%) were Chinese, 2 Malay, 2 Eurasian and 1 Indian. 17 presented with motor and 4 with sensory symptoms. Of the former, 3 had asymmetrical involvement (1, pure upper extremity weakness) but had sensory involvement as well. All patients with sensory presentations had mild distal motor weakness although the sensory complaints were predominant. Cranial nerve involvement included dysphagia, dysarthria and bilateral facial weakness in 1 patient each. Cerebrospinal fluid protein was raised in all but 2 patients, 1 of whom was the patient with asymmetrical upper limb weakness. Mean CSF protein was 154 mg/dL. Concurrent medical disease was seen in 7 (33%) and included diabetes, hypertension, asthma, NPC, alveolar cell carcinoma and HIV infection. Function on admission was severe (grade 3 or more) in 14 patients (67%) while only 7 patients (33%) were grade 1 or 2. 9 patients were treated initially with oral steroids, 6 had plasma exchange and 3 with intravenous immunoglobulin. Mean follow up was 31 months (4 to 120 months). 3 patients were lost to follow up. The other treated patients improved at least 1 functional grade except 1 patient who had underlying alveolar cell carcinoma who subsequently died. 8 patients had relapsed symptoms after improvement but these occurred after reduction of steroid dose. Only 1 patient had true relapsing disease prior to treatment. *Conclusion:* The clinical spectrum of CIDP may be a more heterogeneous than previously thought. This is important as atypical patients may also respond to therapy.

68. Peripheral neuropathy in cirrhosis patients: Correlation between the severity of liver dysfunction and the degree of peripheral neuropathy

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Background: Liver cirrhosis is a progressive liver disease. There are many causes for liver cirrhosis which may result in various complications. One of the neurological complications is peripheral neuropathy. *Objective:* The aim of this study is to investigate whether there is correlation between the severity of liver dysfunction in cirrhosis patients and the degree of peripheral neuropathy. *Method:* We investigated 46 cirrhosis patients with ages from 30-60 years old. We divided the patients in two groups, based on the Child-Pugh classification and we investigated all patients by physical, neurological and electroneurographic examinations. Cases with other causes of peripheral nerve disease were excluded from this study. The degree of peripheral neuropathy was assessed using the Dyck criteria. *Results:* Peripheral neuropathy was found in 74% of the cirrhosis patients, 20% of the cases were asymptomatic. There were significant differences in signs and neurological deficits between cirrhosis patients with Child-Pugh B and Child-Pugh A classifications ($p < 0.005$). The nerve conduction velocities of the Tibial, Peroneal and Sural nerves were significantly slower in Child-Pugh B patients than in Child-Pugh A patients ($p < 0.005$). Peripheral neuropathy in Child-Pugh patients B were found to be significantly more frequent and more severe than Child-Pugh A patients ($p < 0.005$). *Conclusion:* The severity of liver dysfunction in cirrhosis patients had significant correlation with the severity of peripheral neuropathy.

69. Carpal tunnel syndrome and 'F' response latencies

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Background: The clinical diagnosis of Carpal Tunnel Syndrome (CTS) is confirmed by electrophysiological studies. Several electrophysiologic parameters have been reported to be indicative of Carpal Tunnel Syndrome with varying degrees of sensitivity. *Objective:* We wish to report on yet another parameter, the comparative evaluation of 'F' response latencies of the median and ulnar nerves as being a sensitive parameter in diagnosing CTS. *Methods:* Patients who had clinical and electrophysiological features and relief of symptoms with treatment were considered to have CTS. The electrophysiologic workup of 160 such patients evaluated since 1997 were reviewed. All these patients had motor, sensory and 'F' response studies done on both median and ulnar nerves. The minimal 'F' response latencies obtained on median and ulnar nerves were compared in each upper limb. The minimal 'F' response latency on the median nerve was noted to be less than that on the ulnar nerve in controls. *Results:* 129 out of the 160 patients with CTS had median nerve 'F' response latency longer than that of the ipsilateral ulnar nerve. In another 25 patients the median nerve 'F' latency was equal to that of the ulnar nerve. Thus the median nerve 'F' response latency was noted to be increased in 154 out of 160 patients with CTS compared to the ulnar nerve.

Conclusion: Prolongation of 'F' latency on the median nerve compared to that of the ipsilateral ulnar nerve is a sensitive diagnostic parameter of CTS. The advantages of this parameter are that it is simple, easy to perform, less time consuming and is sensitive and reliable in diagnosing CTS.

70. Epidemiology of Guillain Barré syndrome in district of Galle, Sri Lanka

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Background & Objectives: Guillain Barré Syndrome (GBS) is the commonest cause of acute flaccid paralysis in Sri Lanka. The aim of this study was to find out the incidence of GBS in administrative district of Galle, Sri Lanka. *Method:* We scrutinized the case notes of all the patients categorized under ICD 10 G61.0, from 1995 to 1999. Cases fulfilling NINCDS criteria for GBS were included in the study. We excluded the patients referred from other districts for calculation of the incidence of GBS in Galle. Official population statistics and the regional rainfall recorded in the meteorological department were used for analysis. *Results:* There were 113 patients fulfilling above criteria over the study period. Seventy-nine patients were from Galle District. The age distribution shows a bimodal pattern with peak incidence in 10-20 age group and a smaller peak in 30-40 age group. Forty-four were males and 35 were females. The mean population of Galle District for the study period was 1,150,000. Numbers of cases reported in years 1995 to 1999 were 9, 17, 14, 20 and 8 respectively. This is equivalent to a crude incidence of 0.9, 1.7, 1.4, 2.0 and 0.8 per /100,000 population for each year respectively. Mean incidence for the study period was 1.3 per 100,000. Seasonal variation is noted with clustering of cases around months of December-January and May-June. The seasonal clustering followed the high rainfall in years 1996, 1997 and 1998. Identified preceding illnesses were upper respiratory tract infections (18), diarrhoea (6), varicella (3) and non-specific viral infections (4)

Conclusion: The mean incidence of GBS in Galle District is 1.3 per 100,000 population with a range of 0.9 to 2.0 over the study period. Figures are similar to those reported in developed world. This figure is likely to be accurate, as cross boundary referrals outside Galle is unlikely. The age distribution, seasonal variation and the preceding factors are different from those reported from many other countries.

71. Poliomyelitis-like syndrome following asthmatic attack (Hopkins syndrome) treated with intravenous gamma globulin.

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Case Report: An 11-year old girl developed acute flaccid paralysis of all four limbs 4 days after an asthmatic attack. Examination revealed weakness of the right upper limb and both the lower limbs, with the right lower limb being most severely affected. The weakness worsened and within 2 days all four limbs were affected. Electromyography revealed evidence of anterior horn lesion with absent motor unit activity and positive sharp waves at rest. Intravenous immunoglobulin at 2g/kg was given once 2 days after the onset of the weakness. She improved and 6 weeks later had only residual weakness of the proximal muscles of the right lower limb.

Conclusion: The prognosis of Hopkins Syndrome is said to be poor. Most patients with Hopkins Syndrome are left with permanent weakness of the affected limbs. This is a single case with favorable outcome following intravenous gamma globulin treatment.

72. Mixed nerve potentials in brachial plexopathy

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Background: Electrophysiology is often used in the study of brachial plexus lesions. However, conclusions are often indirectly derived due to its proximal location and relative inaccessibility. Recording evoked responses over the brachial plexus may provide more direct neurophysiological evidence of underlying brachial plexopathy. *Objective:* To evaluate the usefulness of Erb's point potentials derived with mixed nerve stimulation in brachial plexus lesions. *Methods:* Fourteen consecutive patients with clinical and electrophysiological evidence of unilateral brachial plexopathy were studied. All patients had supramaximal mixed median nerve stimulation at the elbow and recording of responses from Erb's point, averages of 20 responses were determined for each arm. In each patient the ratio of averaged amplitude of recorded potentials from the affected arm to normal arm was calculated. For 20 controls studied, the side with lower amplitude recorded was used as the numerator in calculating the Erb's point ratio. *Results:* In the controls, mean calculated Erb's point ratio was 0.79 +/- 0.26 (+/-2SD). Responses were absent in 5 patients on the affected side. In 3 of 4 patients with upper trunk lesions, 1 patient with upper and middle trunk lesions, 1 patient with lower trunk lesions and 2 of 3 patients with lesions involving all trunks had ratios lower than controls. *Conclusion:* Erb's point amplitude ratios with mixed nerve stimulation can be useful adjuncts in the electrodiagnosis of brachial plexopathies.

73. Isaac syndrome: A case report

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Isaac syndrome, or neuromyotonia is a very rare condition characterized by muscle fiber hyperactivity leading to muscle cramps, stiffness, fasciculations, and myokymia. The condition is diagnosed by detection of neuromyotonia which is bursts of muscle unit action potential (MUAPs) firing at varying speeds; up to 50 Hz or even 200 Hz. Many cases appear to have autoimmune cause and many are associated with myasthenia gravis, thymoma, small cell lung carcinoma, following radiation and chronic peripheral neuropathy. Some cases have antibodies against voltage-gated potassium channels. Most cases respond to anti-convulsants. *Case report:* The patient was a 28-year-old Chinese lady who was married with 2 children. She presented with muscle stiffness, cramps and frequent spontaneous twitching of muscles for 5 years. The symptoms occurred insidiously and they were not

progressive. The stiffness and cramps were painless, precipitated by movement and aggravated by cold temperature. They were relieved by repeated movement of the muscles involved. Her distal muscles were more severely affected than proximal. They were associated with twitching of muscles (face, body and trunk), and excessive sweating. Examination revealed stiffness of arms and legs simulating myotonia. The wrists were mildly flexed and fingers extended. The feet were plantar flexed. Myokymia and fasciculations were also noted. Muscles power and deep tendon reflexes were normal. Examinations of other systems were not remarkable. Needle EMG revealed spontaneous neuromyotonia. The MUAPs were of normal durations and amplitudes. Other investigations did not reveal any associated disorders mentioned above. She was given carbamazepine 200mg bd and her stiffness and cramps resolved completely within 1 week of treatment.

74. Early detection of diabetic neuropathy: A comparative study of electrophysiological tests

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Objectives: To describe and evaluate sural radial amplitude ratio (SRAR), absolute SNAP amplitude, sural SCV, F-ratio and the presence of carpal tunnel syndrome (CTS) as early indicators for subclinical diabetic neuropathy. *Methods:* A total of 144 patients with diabetes mellitus type 2 were studied. Determination of SNAP, SCV, SRAR, F-ratio and detection of CTS were done. *Results:* The CTS protocol showed the greatest number of abnormal values when considered alone among the patients with early-onset and subclinical diabetes mellitus. On the other hand, only the SRAR was strongly correlated with the progression of the disease. The SNAP, SCV, F-ratio and the CTS protocol values only became significant once they were taken together.

Conclusion: The presence of CTS can be a useful parameter in the detection of early, even subclinical neuropathy. However, SRAR determination can provide good correlation with the duration of disease.

Movement Disorder (75-80)**75. [³H]Mesulergine binds to serotonin 5-HT_{2C} receptors in the postmortem human brain: Effects of Alzheimer's and Parkinson's diseases**

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Background and Objectives: Serotonin 5-HT_{2C} receptors are involved in a variety of functions such as locomotion, feeding, cerebrospinal fluid production and emotional processes such as anxiety. It is found in high concentrations in the choroid plexus and limbic system. There are also studies which show its presence in the neocortex, but this finding has been challenged by others. The serotonergic system is often perturbed in neurodegenerative diseases such as Alzheimer's Disease (AD) and Parkinson's Disease (PD). However, the effects of these diseases on the state of 5-HT_{2C} receptors are unknown. In this study we use [³H]mesulergine to study the presence of 5-HT_{2C} binding sites to the neocortex and the state of these receptors in the postmortem brains of AD and PD patients. *Methods used:* [³H]mesulergine radioligand binding assays were employed on postmortem brains. Competition studies with various agonists and antagonists were done to characterize the [³H]mesulergine binding sites in normal neocortex. Then saturation binding studies were performed on 20 control, 20 AD and 10 PD frontal and temporal cortices, as well as on control and PD putamen, to measure the affinity (K_D) and density (B_{max}) of the binding sites. *Results:* The binding affinity profile of antagonists and agonists suggests that [³H]mesulergine binds to 5-HT_{2C} receptors in the neocortex. For the saturation binding studies, [³H]mesulergine binding sites were significantly reduced in the frontal cortex of PD, while binding affinity remained unchanged.

Conclusion: [³H]Mesulergine binds specifically and saturably to sites in the neocortex which display binding characteristics suggestive of 5-HT_{2C} receptors. These receptors are reduced in the frontal, and not temporal, cortex of PD patients, suggesting that neurons bearing 5-HT_{2C} receptors are lost in a region-specific manner in PD.

76. Spinocerebellar ataxia, a clinical and genetic study in Malaysia.

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Background: Hereditary spinocerebellar ataxia (SCA) are a group of clinically and genetically heterogeneous degenerative disorders. In addition to cerebellar and pyramidal dysfunction, other types of neurological manifestations are usually present. *Objectives:* To define the phenotypes and genotypes of 37 clinically diagnosed SCA subjects at University Malaya Medical Centre from 1996-2000. *Methods:* All subjects underwent genetic study (SCA1-3 genotypes). Neuroimaging studies of brain (MRI / CT) were carried out when possible. *Results:* There were 22 Chinese (60%), eight Malays (22%), six Indians (16%) and one Eurasian (3%). The male : female sex ratio was 1.8 : 1. Eleven subjects (30%) had positive family history. Autosomal dominant inheritance was seen in nine patients (24%) and anticipation seen in the families of two patients (5%). The mean age at onset of symptoms was 37 years (range 10-77 years). The clinical features were: gait ataxia (97%), spastic limbs (51%), dysarthria (43%), extensor plantar response (16%) and impaired sensation (8%). The genotypes seen were : SCA3 (10 patients, 27%), SCA2 (5 patients, 14%), SCA1 (1 patient, 3%) and undetermined (21 patients, 57%). The genotypes among the 22 Chinese patients were: SCA3 (8 patients, 36%), SCA2 (2 patients, 9%) and undetermined (12 patients, 55%). The genotypes among the 8 Malay patients were: SCA3 (2 patients, 25%), SCA2 (1 patient, 13%) and undetermined (5 patients, 63%). The genotypes among the 6 Indian patients were : SCA2 (2 patients, 33%), SCA1 (1 patient, 17%) and undetermined (3 patients, 50%). Of the patients with positive family history, 6/11 (55%) had SCA3. There was no significant difference in the neurological signs among patients with

different genotypes. Seven out of 10 subjects had cerebellar atrophy on neuroimaging studies.
Conclusion: SCA was seen in all three main ethnic groups in Malaysia. SCA3 was the most common genotype seen among the Chinese and Malays, and SCA2 was the most common among the Indians.

77. Efficacy of muscle afferent block using intramuscular injection of lidocaine and ethanol among Filipino patients with dystonia

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Background: Despite the recent advances in science, there is still no known treatment for dystonia. In the Philippines, dystonia patients are in need of a cheaper alternative to treatment. Previous reports using muscle afferent block for dystonia showed promising results. **Objective:** To determine the efficacy of muscle afferent block using a combination of lidocaine and ethanol injected intramuscularly into target muscles in patients with dystonia. The response to therapy was measured both clinically and electrophysiologically. The reactions and possible side effects to the drug were also noted. **Method:** This was a prospective open trial. Adults with drug resistant dystonia or who have focal problematic areas were included in the study. Intramuscular injection using 0.5% lidocaine given at a volume depending on muscle size, was followed by an injection of 95% Ethanol (amount is 1/10th that of lidocaine). Patients were injected and evaluated every two weeks. Responses to treatment were measured a few minutes after injection and after 2 hours. An equal amount of saline was given to serve as control. Outcome measures were based on electromyographic (EMG) findings, clinical rating scales and subjective improvement using self assessment scale. **Results:** All the nine patients enrolled in the study all showed clinical improvement after injection with MAB. Effects lasted for an average of 3.4 days. There was statistically significant reduction in MUAP amplitude ($p=0.003$), reduction in dystonia scale scores ($p=0.014$) and an overall satisfaction of 45%. There was statistical difference between saline injections and MAB ($p=0.002$). No adverse effects were noted. The duration of drug effect as well as the reduction in movement and disability scores was proportional to the number of injections given.

Conclusion: The use of muscle afferent block using lidocaine and ethanol is effective for patients with dystonia. There is significant improvement based on outcomes measured. It is safe and practical, and patients are satisfied with the results. This study demonstrates a cheaper alternative to patients with dystonia especially those who warrant botulinum injections but can not afford it due to economical reasons.

78. Hemifacial spasm and hypertension: A case-control study

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Introduction: The cause and effect of hypertension in hemifacial spasm (HFS) has been debated. If vascular compression in HFS predisposes to hypertension, decompression surgery will be preferred to botulinum toxin treatment. To date, there has only been one proper controlled study of hypertension in HFS. **Objective:** In a case-control study, we determine the prevalence of hypertension amongst HFS patients in Singapore, and examine for any Magnetic Resonance Imaging/Angiography (MRI/A) differences in HFS patients with and without hypertension. **Methods:** Sixty-seven HFS patients and 312 age and sex matched controls without HFS were studied. Hypertension was diagnosed based on World Health Organisation recommended criteria. MRI/A sequences (including 3-D multiplanar reconstruction and CISS) with high sensitivity for neurovascular conflict were performed in HFS patients. **Results:** The mean age in HFS and controls was 54.2 ± 12.2 (SD) years (range 27 to 79) and 55.1 ± 14.1 (SD) years (range 26 to 82) respectively. Forty-four (65.7%) of HFS patients had left-sided symptoms, with mean duration of symptoms of 3.8 ± 3.3 (SD) years (range 0.2 to 16). The prevalence of hypertension in HFS and controls was 21 (31.3%) and 104 (33.3%) respectively. The difference was not statistically significant. Amongst the 21 patients with

HFS and hypertension, the diagnosis of hypertension preceded HFS symptom onset in 16 (76.2%). MRI/A revealed no significant difference in the prevalence of neurovascular conflict between HFS patients with and without hypertension (83.3% vs 88.0%).

Conclusions: We did not find any significant association between hypertension and HFS, and no significant MRI/A differences in HFS patients with and without hypertension.

79. Paroxysmal exercise-induced dystonia caused by an insulinoma

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Paroxysmal exercise-induced dystonia is a rare form of paroxysmal dyskinesia that has been associated with hypoglycemia and insulinoma in only one previous report. We report a man who presented with paroxysmal exercise-induced dystonia due to hypoglycemia resulting from an insulinoma. *Case Report:* This was a 29 years old man with recent closed mild head injury. Initial CT scans of the head after the injury were normal. His symptoms began 2 months after the head injury. He would develop dystonia of both feet and legs after 5 kilometres of running, and each episode would last 15-30 minutes. These episodes always started on the right. He also had episodes of confusion which were improved after a meal or a drink containing sugar. He had gained 5 kilograms over a 6 month period due to increased appetite. He was found to have hypoglycemia and an inappropriately high plasma insulin and C-peptide concentration. A video recording done of this patient when jogging with a blood glucose level of 1.8 mmol/L showed dystonia after 30 minutes of jogging, which resolved when his blood glucose level was brought up to 2.1 mmol/L after a sweet drink. MRI with proton ¹H spectroscopy done 3 months and 10 months after his head injury showed post-traumatic diffuse axonal injury to his left globus pallidus. Laparotomy revealed a 1 centimetre histologically-confirmed pancreatic insulinoma which was removed completely. He remained symptom-free after surgery. Fasting blood glucose levels, insulin and C-peptide levels normalized post-operatively. A repeat video recording done 2 months post-operatively showed no dystonia even after 45 minutes of exertion. We postulate that the head injury may have caused striatal axonal injury. The double insult with neuroglycopenia from his insulinoma, resulted in his paroxysmal exercise-induced dystonia.

80. Adult-onset Hallervorden-Spatz syndrome in Thailand: A case report.

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Hallervorden-Spatz syndrome is an extremely rare autosomal recessive disorder. Most of the cases begin prior to age 10 years. However, adult onset may be found. The clinical manifestations are progressive dementia, dystonia, ataxia, apraxia, spasticity, choreoathetosis, visual and auditory hallucinations, and optic atrophy. The characteristic pathologic finding is iron deposit in globus pallidus, pars reticula of substantia nigra and, less often, in cerebral cortex. In 1996 the Hallervorden-Spatz gene has been mapped to the short arm of chromosome 20 (20p12.3-p13). *Case Report:* This was a 40 year-old woman with slow progressive cerebellar dysarthria, gait disturbance, mild postural instability, spasticity and rigidity of all extremities, and impaired cognitive functions. The magnetic resonance image (MRI) showed typical "eye of the tiger" sign. The levels of serum iron, total iron binding capacity, serum copper, serum celluoplasmin, liver function test, and chromosome study were normal. MRI and chromosome studies of the first-degree relatives were also normal. Improvement of Unified Parkinson's Disease Rating Scale was observed after the treatment with levodopa/decarboxylase inhibitor.

Headache and Pain (81-87)

81. Red flags in headache and neuroimaging: The correlation.

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Background: Headache is one of the most common complaints. As we cannot scan every patient, selection of headache patients for neuroimaging to look for secondary causes is very important. Most patients who have intracranial pathology, present with clinical feature or features that would raise a red flag. These features can help the clinician to identify dangerous headache. This list of red flags, apart from increasing the yield on neuroimaging, can also act as a screening tool to help identify headache patients who would benefit from prompt neuroimaging. *Objective and Methods:* The aim of this study is to evaluate the clinical features that raise a red flag in headache and outcome of neuroimaging as a screening tool to predict intracranial pathology. A descriptive study of 111 patients who had undergone neuroimaging with headache as the main indication was included. The outcomes were divided into positive and negative. Twenty clinical features were taken as red flags and elicited from the medical records. Correlation of the red flags and abnormal neuroimaging were analysed using Logistic Regression model. The Receiver Operating Characteristic curve (ROC) plotted to establish the cut-off number of red flags to predict abnormal neuroimaging. *Result:* There were 39 patients with abnormal neuroimaging. Three red flag features proved to be statistically significant on both Univariate and Multivariate analysis. They were paralysis, papilloedema and “drowsiness, confusion, memory impairment and loss of consciousness”. Weight loss was not an important feature. Nausea or vomiting were important associated features in secondary headache. Presence of 3 or more red flags, is a strong indicator for abnormal neuroimaging in headache patients. *Conclusion:* Paralysis, papilloedema and “drowsiness, confusion, memory impairment and loss of consciousness”, were important red flags to predict abnormal neuroimaging in headache patients.

82. Suandok Headache Score and Suandok Headache Questionnaire in diagnosis of common benign headache.

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Background & Objective: The Suandok Headache Questionnaire (SHQ) was designed to collect all details of headache. The Suandok Headache Score (SHS) was obtained from reliable important data interpretation from SHQ. The objective of this study was to examine the validity of the SHS to distinguish migraine from other benign non-migraine headache. *Method:* We conducted prospective data collection from SHQ between Jan to March 2001. The total 167 patients with benign headache, diagnosed by neurologists using the International Headache Society criteria (IHS) 1988. All patients have completed SHQ by a registered nurse, confirmed by one neurologist. *Result:* The SHS score was the sum of the significant five important headache items, namely nausea ($p=0.006$), and family history of migraine (FHx; $p=0.018$), past history of headache (PHx; $p=0.036$), oral contraceptive (OC; $p=0.035$) and sex ($p=0.003$). SHS equaled to 1.184 (nausea) $+0.929$ (FHx) $+1.081$ (PH) $+1.975$ (OC) $+1.282$ (sex) -2.808 . After re-testing SHS in this population, both migraine and non-migraine group have score range that are nearly overlap.

Conclusion: This preliminary study in northern Thai population suggests that SHS is not yet a good tool to distinguish migraine from benign non-migraine headache. SHQ is helpful to collect all details of headache for further extensive data analysis. Further study in large population to test validity and reliability of this questionnaire as well as headache score is in progress.

83. Ramadan headache

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Objectives: To study the effect of the fasting month of Ramadan on the natural history of headache.
Methods: Subjects were assessed for the presence of headache over four months period (two months before fasting, the fasting month and one month after fasting). The global severity of headache was graded monthly by using the Chronic Pain Index (CPI). The three subscales of CPI were Characteristic Pain Intensity (CPI_I) score, Disability score and Disability Point. *Results:* The subjects were recruited among hospital staffs and students. Eighty-three subjects were studied, the mean age was 22 years (range 18-47 years) and male : female ratio was 1 : 3. Pre-existing headache was present in 40% of subjects (33/83). The CPI score increased during fasting month, but it was not statistically significant. The CPI_I and Disability scores increased significantly during fasting month compared with the first month ($p < 0.05$). Among the 33 subjects with pre-existing headache, during the fasting month the CPI_I score increased in 48% (16/33), decreased in 30% (10/33) and was unchanged in 22% (7/33). Out of the 16 subjects who had exacerbation of headache, 14 had mainly throbbing, bifronto-temporal headache with eight reporting a change in the character of headache. Among the 50 subjects without pre-existing headache, 34% (17/50) had headache during fasting month, out of which, 11 had throbbing bifrontotemporal headache. Staff nurses were more likely to have headache during fasting compared to students (80% versus 50%).
Conclusions: The fasting month of Ramadan was an important precipitating factor for headache. Headache was usually throbbing and bilateral.

84. The efficacy of paracetamol, diazepam, amitryptiline and caffeine combination in patients with tension-type headache

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Background: Tension-type headache is common. The medication for tension-type headache given to patients who are treated at Neurology Outpatient Department of Dr. Sutomo General Hospital is a combination of paracetamol, diazepam, amitryptiline and caffeine (PDAC) has been effective in reducing headaches in clinical practice. However, the efficacy has yet to be subjected to clinical trial. *Objective:* To compare the efficacy of PDAC and Mefenamic acid in the treatment of tension-type headaches. *Methods:* A double-blind clinical trial was carried out in 40 patients, aged between 15 - 60 years, seen at the Neurology Outpatient Department, Dr. Sutomo General Hospital. The patients studied were categorised into two groups - the PDAC group (n = 20), treated with Paracetamol 300 mg, Diazepam 1 mg, Amitryptiline 3 mg, Caffeine 30 mg and the Mefenamic acid group (n = 20), treated with Mefenamic acid 500 mg. The Visual Analog Scale based on patients' perception was used to measure the degree of pain. Statistical analyses was carried out using the chi-square and t-tests. *Results:* There were no significant demographic and clinical differences between two groups and no patient dropped out of the study. The mean efficacy of pain relief was $1.500 + 1.158$ in PDAC group and $0.700 + 0.733$ in Mefenamic acid, $P = 0.013$ and 95% Confidence Interval (0.180, 1.420). *Conclusion:* There was statistically significant difference between the mean efficacy of the PDAC group and the Mefenamic acid group. Thus, PDAC is better than Mefenamic acid in relieving pain in Tension-Type Headache patients.

85. Survey of cultural and public perception on the precipitating causes and relieving measures in headaches within the Klang Valley, Malaysia

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Background: Attributed precipitating causes of headaches among patients vary widely in published medical literature and such variations are on many occasions, best described as peculiar to certain cultures and geographical locations. *Objectives:* A survey was performed in the urban areas of Kuala Lumpur and Petaling Jaya to: 1) assess the commonly held beliefs on the various precipitating factors of headaches 2) to determine the measures employed by the survey population to alleviate their headaches. *Methods:* Prospective cross-sectional community survey conducted by medical students with a standard questionnaire. They were trained to perform standard 10-minute oral interview with the subjects. *Results:* A total of 600 subjects were surveyed. The response rate was 82%. The male to female ratio was 1:1.01. The age range was from 12 to 65 years. 452 (92%) subjects have experienced headache before. 203 (41%) subjects have headaches once or more than once a week. The most common factors attributed to precipitate headaches were stress (70%), lack of sleep (62%), sun exposure (43%) and excessive weather related heat or coldness (38%). 78% and 39% of subjects believe that alcohol and high coffee intake were precipitating causes respectively while 58% perceive food as a causative factor. Among the specific foodstuffs, there was a perception that “heaty food” such as mutton, durian, chocolate, fried spicy food precipitate headaches. The percentages of subjects who believed this concept ranged from 12% to 18%. “Cold food” which refers to cold or drinks, certain vegetables and citrus fruits had a range 18% to 3% of subjects attributing headaches to them, respectively. Measures taken by the subjects to alleviate headaches included taking naps (60%), over the counter medication (59%), visiting the general practitioner (37%) and massage (31%). Using herbal tea (10%) and alternative medicine such as acupuncture and traditional medicine practitioners (5%) appeared to be less prevalent.

Conclusions: Headache is a common disorder. Food, coffee and alcohol appear to be commonly perceived precipitating factors. Cultural peculiarities include the belief of the concept of “heaty” and “cold” foods, contributing to headaches. The majority of subjects prefer simple measures and self-medication to relieve their headaches. Medical attention also appear to be commonly sought while the use of alternative medicine was uncommon.

86. Gamma Knife Radiosurgery for Trigeminal Neuralgia

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Background: Gamma knife stereotactic radiosurgery is currently the least invasive and safest surgical option for patients with medically refractory trigeminal neuralgia.

Objective: To review the treatment of trigeminal neuralgia with gamma knife in the Singapore Gamma Knife Centre. *Results:* At the Singapore Gamma Knife Centre, 17 patients underwent gamma knife radiosurgery as an outpatient procedure for medically refractory idiopathic trigeminal neuralgia by the author from January 1997 to February 2001. All these patients were no longer responsive to high doses of Tegretol and Gabapentin. There were 8 female and 9 male patients and their ages ranged from 28 years to 80 years. Duration of pain ranged from 4 months to 18 years. 7 cases had undergone previous surgical treatment before and had recurrent trigeminal neuralgia pain. 10 patients were de novo cases treated with the gamma knife. Most patients had classic typical features of trigeminal neuralgia but 3 patients described additional atypical features. Single isocentre treatment using the 4mm collimator was used in all the cases and the root entry zone was targeted close to the pons. Dose prescribed was 70 to 90 Gy to the 100% isodose. Follow-up was available in these 17 cases. Results were very much in accordance with the reported literature. In this series complete pain relief (with no further medication required) was achieved in about 60% of cases (10 patients) while partial pain

relief was obtained in close to 20% of patients(3 patients). 1 patient required repeat gamma knife treatment to achieve more lasting pain relief. Apart from 2 patients reporting increased subjective facial paresthesias or numbness, there were no complications in this series.

Conclusion: Gamma knife radiosurgery is hence a safe, low risk and effective treatment for idiopathic trigeminal neuralgia and very likely will become an important surgical treatment option for this condition in the future.

87. Pain And Headache in the Neurological Department, Hasan Sadikin General Hospital, Bandung, Indonesia

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Background & Objective: Pain and headache are frequent presenting complaints at the outpatient clinic of the Neurology Department. This study aim to investigate the ten most frequent conditions seen in a out-patient Neurology Department. *Methods:* The survey was done in The Neurological Department of Hasan Sadikin General Hospital, Bandung Indonesia. The data of the ten most frequent diseases were taken during January 1st until December 31st, 1999. *Result:* There ten most frequent diseases among the 25,017 diagnosed outpatients were: stroke, 5,669 cases (23%); epilepsy, 4,172 cases (17%); headache, 4,089 cases (16%); polyneuropathy, 1,575 cases (6%), radiculopathy, 2,821 cases (11%); carpal tunnel syndrome, 1,914 (8%); myalgia, 1,366 (5%); osteoarthritis 1,244 (5%); low back pain, 1,142 (5%); and arthropathy, 1,045 (4%). A total of 9,512 cases (38%) complained of pain.

Conclusion: Stroke is still the most frequent disease, but about 54 % of the patients complained of pain and headache. More attention must be paid to the latter conditions

Behavioural Neurology (88-98)

88. Cognitive performance of elderly people living in nursing home

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Background: Elderly people are at risk for developing cognitive decline. Early detection of cognitive decline, especially in the preclinical phase of dementia is important for early intervention. Memory is a cognitive function known to decline with age, but attention to other cognitive function than memory is also important. This has been supported by previous studies, which reported that the effect of aging was greatest on the performance of visuospatial and constructive abilities rather than memory. *Objectives:* (1) to identify “normal” subjects from those in the preclinical phase of dementia, (2) to determine the effect of aging and education on the performance of attention, visuospatial, and constructive abilities. *Methods:* Healthy and functionally independent elderly people living in a nursing home were recruited for this study. History and physical examination excluded those with disorders that might adversely affect cognition. All subjects had Clinical Dementia Rating (CDR) of 0 and the lowest cutoff score for their Mini Mental State Examination (MMSE) was 24. Cognitive performance tests on attention, visuospatial and constructive abilities administered and these were the Trail Making Test–A (TMT-A), Trail Making Test-B (TMT-B), and copying the Rey-Ostereich Complex Figure test (ROCF). *Results:* We evaluated 30 subjects (6 men, 24 women) with a mean age of 74.3 (SD = 4.53, range: 67- 84 years). Their mean duration of education was 10.2 years (SD=2.68, range 6-17 years). Their mean MMSE score was 27.87 (SD=1.79, range 14-30). The MMSE scores declined with increasing age ($r=-0.2945$, $p=0.114$) although this was statistically not significant. The MMSE score correlated significantly with the duration of education ($r=+0.5071$, $p=0.0042$). Age did not correlate with TMT-A ($r=-0.1893$, $p=0.316$), and weakly correlated with TMT-B performance ($r=+0.0132$, $p=0.945$). Poorer performance on the ROCF correlated significantly with increasing age ($r=-0.3819$, $p=0.037$). TMT-A and TMT-B performance did not correlated with duration of education (respectively $r=+0.0131$, $p=0.945$ and $r=-0.0862$, $p=0.650$). The ROCF scores also did not correlate with duration of education ($r=-0.3847$, $p=0.036$), but the time required to finish the task correlated non-significantly with duration of education ($r=-0.1554$, $p=0.412$).

Conclusions: MMSE scores correlated negatively with age and positively with duration of education. Of the 3 cognitive performance tests, only copying the ROCF showed negative correlation with age. Duration of education did not correlate with test performance.

89. Correlation between Mini-Mental Status Examination and Thai Mental Status Examination in Thai demented patients

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Background & Objective: In Thailand, Thai Mental Status Examination (TMSE) has been used for screening dementia since 1994, while the Mini Mental Status Examination (MMSE) adapted for Thai patients has been used later. So we conducted this study to explore the correlation between the two commonly used tests for screening demented patients in Chiang Mai University, Thailand. *Method:* Complete mental examinations of 83 patients with minimal to severe dementia were performed by using both TMSE and MMSE. The statistical analysis was performed by paired student t-test and linear regression. *Results:* In 83 pairs of TMSE and MMSE results, there was statistically significant difference between MMSE and TMSE (mean MMSE = 21.8, mean TMSE = 22.5, $p = 0.004$). In minimal dementia group, defined as MMSE score > 24, MMSE score was lower than TMSE score by 0.8 point (mean MMSE = 27.0, SD = 5.6, mean TMSE = 27.8, SD = 6.2, $p = 0.010$). In mild to moderate dementia group, defined as MMSE score from 10 to 24, MMSE score was lower than TMSE score by 0.9 point (mean MMSE = 19.5 SD = 1.9, mean TMSE = 20.4 SD = 2.1, $p = 0.015$).

In overall demented patients, defined as MMSE score from 0 to 24, MMSE score was lower than TMSE score by 0.9 point (mean MMSE = 18.7 SD = 4.4, mean TMSE = 19.6 SD = 5.7, $p = 0.020$). The correlation coefficient between TMSE and MMSE scores was increased in the patients with MMSE < 25 ($r = 0.892$, $p < 0.0001$), compared to patients with MMSE > 24 ($r = 0.754$, $p < 0.0001$). For the overall results, the correlation between MMSE and TMSE scores was very strong ($r = 0.93$, $p < 0.0001$).

Conclusions: There was a very strong correlation between TMSE and MMSE. The correlation between MMSE and TMSE score was increased in the group of mild to moderate dementia.

90. Neuropsychological screening for cognitive impairment in acute stroke patients

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Objective: To investigate the sensitivity and specificity of dementia screening tools and the prevalence of dementia in stroke in-patients.

Method: 322 acute stroke patients were admitted over three months. Two dementia screening tests; The Elderly Cognitive Assessment Questionnaire (ECAQ) and the Mini Mental State Examination (MMSE), were administered to those who were eligible and gave consent. Patients with borderline scores were given a 6 week appointment for a full neuropsychological assessment. Cognitively impaired patients were investigated for causes of dementia and diagnosed using DSM-IV criteria.

Results: Consent could not be obtained from 124 (38.5%) mainly due to early discharge. 47 (14.6%) were dysphasic and 13 (4%) either died or had stuporous conscious levels. Of the 138 (42.9%) inpatients screened in the initial phase, 35% were cognitively intact ($ECAQ \geq 8$, $MMSE \geq 26$), 46% were in the borderline range ($8 > ECAQ > 5$, $26 > MMSE > 22$), and 19% were cognitively impaired ($ECAQ < 8$, $MMSE < 22$). In those cases that were followed-up, none of the cognitively intact, 25% of the borderline and 77% of the cognitively impaired patients were demented. 83% were diagnosed to have vascular dementia (VaD), 8% were Alzheimer's Disease (AD), 6% were mixed VaD and AD and 3% had dementia due to alcoholism. Logistic regression analysis showed that only MMSE was an independent predictor for dementia ($B=0.35$, $p=0.001$). The sensitivity and specificity of a 21 point MMSE cut-off was 94% (95% CI 82-99%) and 81% (95% CI 72-88%) respectively.

Conclusion: The MMSE proved to be a good predictor of dementia in this sample of stroke patients. A cut-off point of 21 provided the best balance of sensitivity and specificity with a false negative rate of only 6% and a false positive rate of 19%.

91. A vascular dementia battery for Singaporeans: Validation in patients with stroke and dementia

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Objective: Currently available neuropsychological instruments may not be suitable for the assessment of vascular dementia, particularly in a non-Western population with lower educational attainments. We developed a customized neuropsychological battery, which can be administered within 1 hour and covers a wide range of cognitive domains. Norms were obtained from community dwelling Singaporean controls from a wide variety of social and ethnic backgrounds. The battery was further validated by assessing patients with stroke or Vascular Dementia (VaD). *Method:* The battery was administered to 152 normal community dwelling controls, 38 non-demented stroke patients assessed a minimum of 3 months post-stroke, as well as 37 patients with a clinical diagnosis (DSM-IV) of VaD. *Results:* In controls, there was no effect of age but educational status, and to a lesser extent gender, significantly affected performance on a number of sub-tests. In non-demented stroke patients and controls matched for sex and education, there were significant differences in sub-tests pertaining to visuo-motor skills, language fluency and attention. There were significant differences in all sub-tests between matched controls and patients with vascular dementia, whilst there were significant

differences in all except for a limited number of sub-tests between non-demented stroke patients and vascular dementia patients.

Conclusion: This vascular dementia battery distinguishes between controls, non-demented stroke patients and patients with vascular dementia in a multi-racial and multi-lingual society with relatively high illiteracy rates in the elderly population.

92. Screening test for dementia in elderly in a primary health center, South Jakarta

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Background: Dementia is one of the most prevalent neurology disorders in the elderly people. Recognition of early symptoms and signs of dementia and accurate diagnosis of the underlying pathology has important implications in the promotion and prevention as well as the management and prognosis of dementia. *Objective:* To identify and investigate the relationship between demographic factors with dementia in the elderly. *Method:* In descriptive analysis, we assessed the competence of 80s individual aged over 55. Elderly volunteers were recruited from elderly people community at Pesanggrahan and Pasar Minggu Primary Health Center in South Jakarta. Global cognitive function was tested using the Mini Mental State Examination which was compared with Penapisan Dementia such as sex, age, education, occupation and risk factor for dementia. *Result:* 5 (14.9%) individuals had dementia, consisting of 4 men and 1 woman. Four individuals were of low education, all of them were unemployed, 3 with risk factor for dementia. The score of MMSE was related to the memory score of Penapisan Dementia (5 individual with dementia had decreased memory score in Penapisan Dementia test). All individuals with dementia had decrease in registration, recall, digit span, verbal and visuospatial recall tests.

Conclusion: Age, sex, occupation, education and risk factors for dementia are related to dementia. Screening test with MMSE test is important to identify dementia early, for the promotion and prevention management and prognosis of dementia.

93. Dementia in University Malaya Medical Centre

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Objective: To describe the clinical characteristics of dementia patients seen in our institution. *Method:* A prospective descriptive study in which all patients with dementia who were seen in either the neurology or geriatric clinics from 1st February 2000 to 1st February 2001 were screened and seen by one of the authors. *Results:* There were 32 patients recruited, of which there were 15 (47%) males and 17 (53%) females. The mean age was 72 ± 10 years. There were 20 (63%) Chinese, 10 (31%) Indians, and one (3%) each of Malay and Portuguese. 14 (67%) had a past history of hypertension, 7 (33%) had diabetes mellitus, 3 (14%) had hyperlipidaemia, 3 (10%) each of current and ex-smokers. On clinical history, 30 (97%) had forgetfulness, 16 (50%) had deterioration in function of daily activity, 8 had (25%) had inappropriate behaviour, 6 (19%) hallucination or paranoid delusion, and 3 (10%) had depression. The mean delay time from the onset of symptom to diagnosis was 657 ± 693 days (1.8 ± 1.9 years), and ranges from 0 to 2,556 days. The median Folstein's Mini Mental State Examination score at presentation was 14, with range from 0 to 25. Clinically, 14 (44%) were diagnosed to have Alzheimer disease, another 14 (44%) with vascular dementia; 3 (10%) had mixed dementia, and 1 (3%) had presumed hereditary dementia. Computerised tomography of the brain was done in 30 (94%) of the patients, 24 (75%) showed evidence of cerebral atrophy, 13 (41%) showed evidence of previous stroke, in which 8 (25) had multiple strokes and 5 (16%) had single stroke. 10 (35%) showed periventricular lucencies, and male is 3 times more likely to have this than female ($p=0.064$). None had evidence of hydrocephalus. Only 12 (38%) were treated with central acetylcholine agonists (CAA's). Another 3 (10%) could not tolerate the side effects of these medications. Of those 14 patients diagnosed with Alzheimer disease, 9 were treated with CAA's and 3 could not tolerate the treatment. This leaves 2 (14% of Alzheimer) patients not treated.

Of the 18 who did not have Alzheimer disease, 3 (17% of non-Alzheimer) patients were treated with CAA's.

Conclusion: The type of dementia seen in our institution is similar to those seen elsewhere. Only 2 of Alzheimer disease patients was not treated with CAA's.

94. Neurobehavioural disorders in patients with closed head injury

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Objectives: To study the pattern of neurobehavioral disorder (ND) in patients with closed head injury (CHI) and its correlation with education, and severity of CHI. *Methods:* We prospectively studied and analysed 103 patients with CHI. The severity of CHI was determined on admission using Glasgow Coma Scale, only mild and moderate CHI were included in this study. Five components of ND was assessed on discharge using mental status examination/Strub and Black (MSE) - attention, language, memory, constructional ability and higher cognitive function. Nonparametric methods were used to compare means and proportions of ND components between neurobehavioural variables, educational level and severity of CHI. Educational level was divided into three groups - elementary, junior high and senior high school levels. *Results:* All patients had ND. 94 patients (91%) had multiple impairment of ND. The most common ND that occurred in this study was impairment in higher cognitive function (100%). Patients with higher education had significantly higher scores in all MSE components (P value ranging from <0.001 to 0.027) at all levels of CHI severity compared to patients with lower education, except for memory (P=0.05) and constructional ability (P=0.126) in patients with moderate HI. Patients with mild CHI had significantly higher scores in all MSE components (P value ranging from <0.001 to 0.033) at all levels of education than moderate CHI, except for constructional ability (P=0.401) in patients with senior high school education.

Conclusions: All CHI patients had ND and most of them had multiple impairment of ND. The most common ND was higher cognitive function impairment. There was a correlation between ND and education and severity of CHI.

95. Preliminary observations on the immunohistochemical detection of β -amyloid precursor protein in diffuse axonal injury

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Background: Diffuse axonal injury (DAI) is an important type of brain damage occurring as a result of non-missile head injury. When apparent grossly, it manifests morphologically as haemorrhages in the cerebrum and brain stem. Microscopically, DAI can be identified by the presence of eosinophilic axonal bulbs, which are more easily identified in sections stained by silver stains. Unfortunately, these lesions take at least 12 hours to manifest, making the microscopic diagnosis of DAI almost impossible to confirm if death occurred earlier. Lately, an antibody to β -amyloid precursor protein (β APP) has been successfully used to identify axonal bulbs immunohistochemically, yielding positive results as early as 3 hours after trauma. *Objective:* To confirm the usefulness and sensitivity of immunohistochemical detection of β APP in brain tissues for the diagnosis of DAI in the local population. *Results:* Formalin-fixed, paraffin-embedded, brain tissues of 40 patients who died of head injury and were autopsied at the University of Malaya Medical Centre were examined prospectively. Representative sections were stained by a standard immunoperoxidase method for β APP. In the 40 cases analysed, 22 cases (55%) showed positive staining of axonal bulbs. These axonal bulbs which appear as early as 3 hours were readily identifiable, making the diagnosis of early DAI relatively easy.

Conclusion: β -APP immunohistochemistry is a sensitive stain for axonal bulbs and its use enables early and sensitive diagnosis of DAI.

96. The effect of auditory stimulation using close relative's voice on the improvement of consciousness in patients with moderate closed head injury.

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Background: Auditory stimulation using a close relative's voice has been reported to improve consciousness in various studies on patients with moderate closed head injury. One similar study has been conducted in Indonesia with the same result, however, this needs to be elaborated with further studies. *Objective:* To investigate whether a close member of the family's voice would accelerate the recovery of consciousness in patient with moderate closed head injury. *Method:* The study subject consisted of 62 patients with moderate head injury (Glasgow Coma Scale (GCS) 9 – 12), divided into two equals groups. The first group, received auditory stimulation with the voice of a member of family having the closest emotional relationship with the patient, the second group were stimulated with voice of another member of family. We applied repeated auditory stimulation till the patients attained GCS score 15, or until the fourth day. GCS scores were taken at the third, and the fifth day. *Results:* On the third day, 38% or 11 patients in the first group attained GCS score 15, compared with 15% or 4 patients in the second group. On the fifth day, 14 (74%) of 20 patients in the first group and 5 (19%) of 27 patients in the second group, attained GCS score 15. In total, 25 (81%) patients in the first group and 9 (29%) patients in the second group, attained GCS score 15 in fifth day. (p = 0.00004)

Conclusion: Auditory stimulation using the voice of a member of family with closest emotional relationship may accelerate recovery in patients with moderate closed head injury.

97. A Preliminary evaluation of hTAU and β -Amyloid₍₁₋₄₂₎ levels in cerebrospinal fluid in the differential diagnosis of dementia

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Background & Objectives: Alzheimer's Disease (AD) is a major cause of dementia. However, the diagnosis remains one of exclusion. Studies have suggested that the cerebrospinal fluid (CSF) of AD patients have abnormal levels of hTAU and β -Amyloid₍₁₋₄₂₎ (A β), which may aid clinical diagnosis. However, these tests have not been evaluated in Southeast Asian populations. The objective of this preliminary study is to evaluate the use of these tests in the differential diagnosis of dementia patients in Singapore. *Hypotheses:* hTAU and A β levels in normal cases differ across racial groups, hTAU and A β levels are different in AD compared to non-AD cases and Combined specificity of the tests are better than those of individual tests. *Methods:* Commercially prepared enzyme-linked immunosorbent assay (ELISA) methods were used to measure hTAU and A β levels in the CSF of 27 non demented controls, 13 clinical AD, and 24 patients with vascular dementia (VaD) and other neurodegenerative diseases (OND). Results for the control cases were analysed for racial differences. Then data were compared across the diagnostic groups. Specificity of the tests for AD were also measured alone or in combination. *Results:* In the control group, hTAU and A β levels were not significantly different among Chinese, Malays and Indians. hTAU was significantly increased in clinically diagnosed AD patients compared to controls and those with VaD/OND. A β levels were not different across the diagnostic groups. The specificity of hTAU for AD was 69% and that of A β was 17%. The combined specificity of the tests were 74%.

Conclusion: In this preliminary study, only the ELISA for hTAU in CSF seems to be of value in aiding the differential diagnosis of AD.

98. Improved cognitive function in stroke patients following therapy with M-E-H-F-P-G-P, a synthetic neuropeptide

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Background & Objective: The prevalence of stroke in Indonesia is 2 per thousand out of 206 million people or roughly 400,000 patients. The stroke unit of “Gatot Soebroto” Central Army Hospital has a capacity of 12 beds and has successfully reduced the mortality of Ischaemic Stroke by 12% and Haemorrhagic Stroke by 30%. One of the problems stroke patients face is the resulting disturbance of cognitive function that often interferes with their communication and interaction with their surroundings. A synthetic heptapeptide with the structure Methionil-Glutamil-Histidil-Phenylalanil-Prolil-Glycil-Prolin (M-E-H-F-P-G-P) which is an analogue of a short fragment of ACTH without hormonal activity, has neuroprotective, neuromodulating and adaptive effects. Applied as a 0.1% solution, intranasally, it reaches the brain in 60 seconds through retrograde axonal transport. We treated 15 Stroke patients exhibiting mild to moderate cognitive impairments with M-E-H-F-P-G-P. *Methods:* Fifteen stroke patients with mild to moderate cognitive impairment treated with 0.1% M-E-H-F-P-G-P were assessed by the Mini Mental Status Evaluation (MMSE). Caregivers or families were interviewed for their assessment of clinical improvement and response to the medication. The patients were evaluated three times: at baseline, before initiating 3 x 4 drops intranasally/day (0.6 mg) Heptapeptide M-E-H-F-P-G-P 0.1% solution plus aspirin 2 x 100 mg daily for 4 weeks, after 4 weeks and 12 weeks of therapy. We compared with a group of fifteen untreated stroke patients (given only aspirin 2 x 100 mg daily). *Results:* All treated patients showed an increase in MMSE scores compared with the untreated group which only showed a 40% increase.

Conclusion: Taking into consideration that this report is a limited, preliminary clinical experience that needs further studies, neuropeptide, M-E-H-F-P-G-P nasal drops may be able to improve the cognitive impairment in stroke patients.

Others (99-103)

99. Cerebrospinal fluid lactate and pyruvate levels in male chronic schizophrenics

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Objective: Several known mitochondrial disorders present with dementia and schizophrenia-like symptoms. Dysfunctions in the mitochondrial oxidative pathway have frequently been implicated and one manifestation is an elevated lactate/pyruvate ratio. The purpose of this study is to determine and compare cerebrospinal fluid lactate and pyruvate levels in male chronic schizophrenic patients and their age-matched controls and to correlate CSF lactate and pyruvate levels of the schizophrenic group with their PANSS scores and the duration of their illness. *Method:* Patients who have active symptoms and meet the DSM-IV criteria for chronic schizophrenia and their age-matched controls. All patients underwent a history, physical, neurologic and mental status examination including the Positive and Negative Symptoms Scale (PANSS). CSF was collected under aseptic techniques and lactate and pyruvate levels determined by spectrophotometry with an ultraviolet endpoint (340 nm). Correlation of CSF lactate/pyruvate ratio of schizophrenics was done with those of the controls, as well as the duration of illness and their respective PANSS scores. *Results:* Results were based on 20 male schizophrenics and 20 age-matched controls. The CSF lactate and lactate/pyruvate ratio was significantly elevated in the schizophrenic group as compared to controls. Positive correlation was likewise established with the duration of their illness and the negative symptoms score on the PANSS Scale.

Conclusion: We postulate that schizophrenia involves a dysfunction in the brain mitochondrial oxidative pathway with the lactate/pyruvate ratio increasing as they become substrates for this inefficient process. Clinically, this may open avenues to potential pharmacologic intervention to enhance mitochondrial respiratory chain function.

100. The influence of iodine deficiency during pregnancy on tone, primitive and postural reflexes development

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Background & Objective: Iodine deficiency is known to be a significant public health problem in Indonesia and more than 100 countries in the world. The known effects of iodine deficiency during fetal life are the birth of endemic cretinism and non-reversible mild to moderate psychomotor and mental defects in childhood as well as in adult life. Nevertheless, their neurodevelopmental pattern in early life is not clearly defined. By knowing this pattern, the relationship between iodine deficiency and brain development can be more explained. *Method:* The cohort study have been conducted in iodine deficiency area (IDA) and iodine replete area (IRA) in Malang Regency, East Java, and children born and living in non-iodine deficient area (NIDA) of Demak Regency, Central Java as a reference group. From birth until 2 years of age those children were regularly assessed for their tone, posture and reflex development by instrument of Infanib and assessments of motor, communication, adaptation as well as personal-social development by van Wiechen's instrument. The proportional data of laboratory results of the pregnant women showed that serum TSH > 5 μ IU/ml in IDA 11.6% and IRA 1.3%; Serum T4 < 62 nmol/l in IDA 14.5% and IRA 2.6%; UIE of IDA: median 42.5 μ g/l and mode 25 μ g/l; IRA: median 85 μ g/l and mode 99 μ g/l; TSH neonates > 5 μ IU/ml in IDA 29.8% and IRA 2.6% respectively. We found the delay of tone development (hypotonia) in IDA (n=225) until 6 months of age in comparison with NIDA (n=125). This delay was also found in IRA (n=94) although in milder degree and they were able to catch up earlier, which was on 4 months of age. This tone delay was correlated with transient neonatal hyperthyrotropinemia as well as development of motor, communication, adaptation and personal-social domains. Analyses of

postural responses and reflexes development in IDA showed that there were delays on postural reflexes (late infant reflexes), but the pattern of primitive reflexes development was normal. The findings in IRA were similar to those profile but in very mild delay.

Conclusion: This result indicates that iodine deficiency during fetal life has deleterious effects on child neurodevelopment from birth to 2 years of age. It seems that the tone delay is an early important indicator of brain damage due to iodine deficiency. Furthermore, we suspect that the still abnormal thyroid status of the pregnant women in iodine replete area has an important role in affecting child neurodevelopment.

101. Encephalomyeloradiculopathy associated with wasp sting: A case report

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Stings from wasps can cause severe allergic reaction including anaphylaxis. Neurological complications of wasp stings have rarely been reported. We report a young man who developed encephalomyeloradiculopathy after being stung by a wasp. *Case Report:* An 18-year-old man presented with alteration of consciousness and quadriplegia. He was stung by a wasp 16 days previously on the right cheek. On the following day, he suffered from headache, fever and nausea and was admitted to a regional hospital. Three days later, he was drowsy and had retention of urine. Then he developed a generalized tonic-clonic seizure lasting 2-3 minutes. He was intubated and referred to us. At Ramathibodi Hospital, he was comatose, quadriplegic and areflexic. CSF and serum antibodies for Japanese encephalitis and Dengue virus were negative. MRI brain and cervical spine showed multiple lesions at the medulla, pons, midbrain, basal ganglia, thalami, centrum semiovale, cortical gray, and cervical cord. Nerve conduction study showed absence of F-waves of both median and ulnar nerves with absence of motor conduction of both tibial and peroneal nerves. Methylprednisolone was given. On the seventeenth day after the onset, he regained consciousness with limited eye movement and quadriplegia. A month later, plasmapheresis was performed. The power of his upper extremities gradually improved. Three months after admission, he was discharged with paraplegia and sensory level at T1. The wasp was identified as *Vespa tropica*. The pathophysiology may be related to immune response to wasp venom. There may be genetic vulnerability because wasp sting does not cause this clinical feature in all affected persons.

102. Multiple myeloma with paraplegia: A case report

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We report a 42 year old male patient who was admitted to Dr Soetomo Hospital with the chief complaint weakness of both legs, 6 month prior to admission. Systemic examination was within normal limit. Neurological examination revealed paraplegia of upper motor neuron type and pain on pressure above the eleventh thoracic vertebrae. X-ray studies of the vertebral column showed osteolytic lesions in the 11th thoracic vertebra and right 11th rib. Skull X-ray showed multiple osteolytic lesions of the calvaria. Pelvic X-rays showed osteolytic lesions of the superior ramus of the pubic bone, inferior part of the ileum and the proximal part of both femurs. Laboratory findings revealed normal calcium, phosphate and electrolytes. Protein electrophoresis and bone marrow aspiration was in accordance with multiple myeloma.

103. Type I Arnold Chiari malformation accompanied by cervical syringohydromyelia: A case report

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This is the report of a 18 years old male with type I Arnold-Chiari malformation accompanied by syringohydromyelia. He presented to the Neurology Department, Dr Soetomo Hospital with the chief complaint of severe headache for four month. CT Scan of the brain revealed an obstructive hydrocephalus. A ventriculoperitoneal shunt was inserted. MRI of the cervical region revealed syringohydromyelia, which extended from the second to the seventh cervical column. Decompressive surgery with syringoarachnoid shunting was carried out. The neurological status improved after the operation.