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1st Asian Pacific Conference Against Stroke

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1 st Asian Pacific Conference

Against Stroke

17-19 April 2004

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Prof. Ji-zong Zhao	Beijing Tiantan Hospital	Beijing

SCIENTIFIC PROGRAMME

Venue: Kowloon Shangri-La Hong Kong

17 April 2004, Saturday

09:00 - 09:30

Welcoming Speech
Chen-ya Huang, President of Hong Kong Stroke Society

Opening Ceremony
EK Yeoh, Secretary for Health, Welfare and Food

Singing Performance
Stroke Patient Self-help Group

09:30 – 10:40

Symposium I – Frontiers in Severe Stroke Management
(Sponsored by Jing Fan Education Foundation)
Moderators: *Chen-ya Huang, Byung-woo Yoon*

Clinicopathological Aspects of Massive Ischemic Stroke
Wolf Dieter Heiss

Malignant MCA Infarction
Werner Hacke

Neurocritical Care of Patients with Acute Stroke
Ivan Ng
Discussion

10:40 - 11:10

Coffee Break

11:10 – 12:30

Free Paper Presentations – Session I
Moderators: *Xiu-qin Liu, Patrick Li*

Treated Acute Ischemic Cerebral Stroke 630 Cases with Defibras Made in China
Jing-hua Yang

Efficacy and Safety of Anticoagulation in Chinese with Atrial Fibrillation for Stroke Prevention
Chun-ming Cheung

Silent Cerebral Infarction (SCI) in Elderly Subjects with No Neurological Symptoms and Its Significance in First Onset Ischemic Stroke
Jian-hui Fu

Small Subcortical Infarct and Intracranial Large Artery Disease in Chinese
Vincent CT Mok

High Yield of TCD Examinations in a Multi-racial Population
KS Tan

Primary Prevention of Ischemic Stroke – How and to What Extent?
Tak-sun Tse

Pneumonia and Mortality in Acute Stroke Patients with Dysphagia
Ada WS Chu

Intracranial Arterial Stenosis in Atherothrombotic Middle Cerebral Artery Territory of Chinese Patients
Wing-chi Fong

Press conference

12:30 – 14:00 **LUNCH SYMPOSIUM I – FUTURE TREND IN LONG-TERM PREVENTION OF ISCHEMIC STROKE**
(Sponsored by Sanofi Synthelabo HK Limited)
Moderators: *Lawrence KS Wong, Tak-hong Tsoi*

Thrombolysis – Where We Are
Werner Hacke

14:00 – 15:30 **SYMPOSIUM II – FRONTIERS IN CEREBRAL REVASCULARIZATION**
Moderators: *Joseph MK Lam, Ji-zhong Zhao*

Japanese EC-IC Bypass Trial (The JET Study)
Akira Ogawa

Controversies in the Treatment of Carotid Stenosis: Endarterectomy Vs Stenting
Kazuo Yamada

Optimized Management of Carotid Disease
Peter Kirkpatrick
Discussion

15:30 – 16:00 **Coffee Break**

16:00 – 17:00 **SYMPOSIUM III – GLOBAL VIEW OF STROKE PREVENTION**
Moderators: *Richard Kay, WJ Wong*

World Strategy on Stroke Prevention
Shanthi Mendis

Nutritional and Metabolic Risk Factors for Stroke
Mark Wahlqvist

Atherosclerosis and Stroke
Frank M Yatsu

17:00 – 18:00 **BUSINESS MEETING**

18:30 – 22:00 **DINNER SYMPOSIUM – NEW DEVELOPMENT OF STROKE PREVENTION STRATEGIES**
(Sponsored by Boehringer Ingelheim HK Ltd)
Moderators: *Raymond TF Cheung, Patrick Li*

Management of Stroke – Asian Perspectives
Lawrence Wong

Advances in Hyperacute Treatment of Stroke
Werner Hacke

Current Evidence and Future Trends of Secondary Prevention Therapy
Wolf Dieter Heiss

The Way into a New Class of Antithrombotic Drugs
Wolfgang Eisert
Discussion

18 April 2004, Sunday

09:00 – 11:00 **Symposium IV – Frontiers in Stroke Management In Asia**

Moderators: *Raymond TF Cheung, Ivan Ng*

Epidemiology of Stroke and Community-based Intervention Trial in China
Wen-zhi Wang

Treatment of Small Intracerebral Bleedings
Benjamin Chandra

Thrombolytic Therapy in Taiwan
Li-chi Hsu

Acute Stroke Unit in Hong Kong
Lawrence KS Wong

Reassessment of Defibrase in the Treatment of Cerebral Infarction
Xiu-qin Liu
Discussion

11:00 – 11:30 **Coffee Break**

11:30 – 12:30 **Free Paper Presentations – Session II**

Moderators: *John CK Kwok, Wen-zhi Wang*

Intracerebral Haematoma: Operative Versus Non-operative – Local Experience
David TF Sun

Carotid Endarterectomy under Regional Anaesthesia (RACE)
Joseph MK Lam

Clincial Relevance of Severe Initial Hypertension in Acute Intracerebral Haemorrhage
Tat-sun Cheng

Cerebral Revascularization for Moyamoya Disease: Encephaloduroarteriomyosynangiosis (EDAMS) Operation and the Results
Xian-lun Zhu

Treatment of Ruptured Anterior Communicating Artery Aneurysm
George KC Wong

Stroke Caused by Cerebral Venous Thrombosis: Experience in Diagnosis and Treatment
Hoi-tung Wong

12:30 – 14:00 **Lunch Symposium II**

(Sponsored by Pfizer Corporation Hong Kong Ltd.)

Moderators: *John Chan, Ping-wing Ng*

Management of Risks in the Prevention of Stroke
Frans HH Leenen

14:00 – 15:30 **Symposium V – Frontiers in Intracranial Hemorrhage Management**

Moderators: Dawson Fong, Kazuo Yamada

Clipping or Coiling for Aneurysmal SAH
Peter Kirkpatrick

Clinical Characteristics and Surgical Results of 2086 Patients with Cerebral Arteriovenous Malformation
Ji-zong Zhao, Shuo Wang, Jing-sheng Li, Wei Qi, Yuan-li Zhao

The Results of ISAT and the Impact on the Future of Ruptured Aneurysm Management
Andrew Molyneux
Discussion

15:30 – 15:50 **Coffee Break**

15:50 – 17:00 **SYMPOSIUM VI – BREAKING NEWS**
Moderators: *Pui-wai Cheng; Benjamin Chandra*

The Latest/Emerging Development in Endovascular Therapy of Aneurysm
Andrew Molyneux

Stem Cell Research in Stroke
Byung Woo Yoon

Asymptomatic Carotid Stenosis Trial
Peter Kirkpatrick

CLOSING REMARKS

VENUE: HOSPITAL AUTHORITY BUILDING

19 APRIL 2004, MONDAY

14:00 – 14:10 **OPENING REMARKS**
William Ho, Chief Executive, Hospital Authority

14:10 – 15:40 **SATELLITE SYMPOSIUM – STROKE PREVENTION STRATEGIES**
Moderator: *Ping-wing Ng*

Health Promotion in Stroke Prevention
KC Tang

The Role of a Psychologist in Stroke Prevention and Care
Rhoda K Yuen

Secondary Stroke Prevention
Jason Fong
Discussion

15:40 – 16:00 **Coffee Break**

16:00 – 17:30 **SATELLITE SYMPOSIUM – ACUTE STROKE SERVICE DELIVERY MODELS IN SOUTHEAST ASIA**
Moderator: *Patrick Li*
Kuala Lumpur – *KS Tan*
Singapore – *Ivan Ng*
Hong Kong – *Tak-hong Tsoi*
Airlangga – *Benjamin Chandra*
Shanghai – *Jian-hui Fu*
Discussion

17:30 – 17:40 **CONCLUDING REMARKS**
Vivian Wong, Hospital Authority Director

Malignant MCA Infarction

SM I-01

W. Hacke
University of Heidelberg, Germany

Herniation due to cerebral idema is most frequent cause of death in the first 7 days after acute ischemic stroke. Even with thrombolytic therapy, the number of death due to herniation caused by cerebral edema is higher than the death rate in association with symptomatic hemorrhages.

Malignant MCA infarct is a distinct clinical condition that can be easily diagnosed in the first hours after stroke onset. It has peculiar neuroradiological features in both CT and MRI. Standard medical therapy includes sedation, ventilation, osmotherapy, barbiturates and THAM buffer solution, but this therapy most frequently fails and can not prevent the fatal course of the disease, which is more frequent among younger stroke victims.

Over the past 10 years, two invasive treatment options have been developed prospectively, hypothermia and decompressive surgery. In this presentation, I will present the status decompressive surgery for malignant MCA infarction and the status of hypothermia for the same condition. Both interventions can lower the mortality rate of malignant MCA infarct, which untreated is more than 80%, to less than 40%, and in the case of decompressive surgery probably to less than 20%. Whether this is associated with an improved quality of survival is still matter of debate and will be addressed in a forthcoming randomized clinical trial called DESTINY. The protocol of that trial will also been presented.

Treated Acute Ischemic Cerebral Stroke 630 Cases with Defibras Made in China

FP I-01

J. H. Yang[1], F. Y. Li[2], G. X. He[3]
[1]Dep & Research Centre of Thrombo-disease Kunming General Hospital Kunming, China 650032
[2]The Institute for the Control Pharmaceutical of Yunnan province, China
[3]The Institute for the Control Pharmaceutical of Kunming city, China

Twenty years before we purified thrombin-like enzyme from Agkistrodon snake venom and treated acute ischemic stroke with it, and achieved marked effects. But there were four peaks in the drug. From May 1997 to May 1999, our group was composed of seventeen hospitals and used the Defibrase that was a simple peak treated 630 cases of ischemic stroke. Study subjects were randomly allocated to Defibrase. Batroxobin and compare groups. Defibrase, Group A, Batroxobin, Group B. 10. 5. 5 b. u were used intravenous infusion in 250 ml normal saline over 3 hours' period on alternate days. Compare, Group C. used Nimotop, ginado and notoginseng in 250 ml normal saline daily intravenous infusion for 5 days. After which can use other medicine except anticoagulation and thrombolytic agents for the next 9 days.

Result. A. Fibrinogen, group A. B decreased from 3.95, 4.03 to 2.40, 2.61 g/L. However group C did not record much change 3.84, 3.86 g/L respectively. B. The measures of neurological function in this study were the improved scandinavin stroke scale score. Group A, B decreased 9.20, 11.29, group C 6.13. C. Activities index. Group A, B increased to 21.9, 20.5, but group C only 11.2. As mentioned above, the three index group A and B have not much significant difference. Compared with group C there are markedly difference.

D fficacy of the three group were marked as follows: Group A cured 124/408, 30.39%. Improvement 317/408, 77.69%. Group B cured 29/90, 32.22%. Improvement 68/90, 75.55%. Compare cured 32/132, 24.24%. Improvement 79/132, 59.89%.

Discussion. A, Defibrase is an effective drug to acute ischemic cerebral stroke over 24 hours to 14 days. B, the treated time window is longer than urokinase and rt-PA. C, decreased or lysis fibrinogen is the main effect to treated acute ischemic cerebral stroke is secondary effect to the decreased viscosity of blood. D, ratio of bleeding was rather few, intrascred bleeding was 0.98% as compared to 0.76%.

Efficacy and Safety of Anticoagulation in Chinese with Atrial Fibrillation for Stroke Prevention

FP I-02

C. M. Cheung[1], T. H. Tsoi[1], C. Y. Huang[2], K. L. Shiu[1]
[1]Department of Medicine, Pamela Youde Nethersole Eastern Hospital
[2]Department of Medicine, University of Hong Kong

Background and Purpose

Stroke prevention trials in patients with atrial fibrillation mainly studied the use of warfarin in Caucasians and the INR was targeted in the range of 2 - 4. In Chinese, the INR is commonly targeted at 1.5 - 2.5. This study was to find the optimal range of INR when using warfarin for stroke prevention in Chinese patients.

Methods

We performed a retrospective study on all Chinese patients taking warfarin for stroke prevention in our hospital. They had atrial fibrillation, paroxysmal atrial fibrillation or atrial flutter. Patients with mechanical heart valve were excluded. We systemically studied their indication of using warfarin, duration of therapy and all INR results. Thromboembolic episodes, sudden death, major bleeding, intracranial haemorrhage and the INR at the time of event were recorded. The INR range was divided into six categories: <1.5, 1.5-1.9, 2.0-2.5, 2.6-3.0, 3.1-3.5, >3.5. The number of events was recorded for each category and this formed the numerator. The denominator was the summation of time each patient stayed in each category of INR. The event rate was then calculated for each INR category.

Results

582 patients were included in the analysis, they constituted 933 patient-years. There were 37 thromboembolic (total 4.0% per patient-year) and 19 major bleeding (2.0% per patient-year) episodes. The overall event rate were 14.6% in INR <1.5; 3.1% in INR 1.5-1.9; 4.3% in INR 2.0-2.5; 4.2% in INR 2.6-3.0; 10.3% in INR 3.0-3.5 and 41.7% in INR >3.5. The overall event rate for the range of INR 1.5-3.0 was 3.7%, significantly lower than 14.6% in INR <1.5 and 19.5% in INR >3.0 (p=0.003).

Conclusions

Our retrospective cohort showed that an INR range from 1.5 to 3.0 was the optimal range for stroke prevention in Chinese.

Silent Cerebral Infarction (SCI) in Elderly Subjects with No-neurological Symptoms and Its Significance in First Onset Ischemic Stroke

FP I-03

C. Z. Lu, J. H. Fu
Department of Neurology, Hua Shan Hospital, Fudan University, 200040 Shanghai, China

Purpose
To investigate the abnormalities in deep white matter, periventricular areas on MRI in healthy elderly subjects and to evaluate the significance in ischemic stroke.

Methods
We connected 109 cases of patients aged over 60 years with non-diseased subjects who complained of dizziness, numbness from out-patient department from September 2001 to December 2002, 228 patients with the first onset of ischemic stroke from in-patient department of neurology since September 1999 to October 2001. All subjects had MRI examination with FLAIR sequence. Based on the distribution, severity of abnormalities on FLAIR MRI, we divided the SCI into subcortical deep white matter hyperintensity (SDWMH), periventricular hyperdensity (PVH), mixed (SDWMH) plus PVH types, and 1,2,3 grades in each type. Based on the SCI findings in patients with the first onset of ischemic stroke, we also divided the SCI in those patients into non, mild, moderate and severe four grades.

Results
89 (81.7%) subjects with no-neurological symptoms had various subcortical deep white matter hyperdensities (SDWMH), 93 (85.3%) subjects had various periventricular hyperdensities (PVH) and 99 (90.8%) cases of subjects showed to have a mixed SDWMH and PVH. Among 228 patients with the first onset of ischemic stroke, there were 197 (86.4%) patients with various abnormalities on MRI pictures either SDWMH, PVH or mixed SDWMH and PVH. After logistic regression analysis, it demonstrated that age (p=0.0001), hypertension contorted (p=0.0122) are independent risk factors for SCI. After 3-year follow-up, we found that the recurrence rate of stroke was 3.23%, 7.83%, 7.83% for non-SCI, 3.23%, 3.23%, 9.33% for mild, 9.42%, 17.73%, 17.73% for moderate and 15.85%, 30.21%, 43.65% for severe patients respectively. The survival rate within 3 years was respectively 96.77%, 92.1%, 92.17% for non-SCI, 96.82%, 96.82%, 91.98% for mild, 91.67%, 91.67%, 83.73% for moderate and 87.54%, 78.78%, 75.58% for severe patients with SCI. And after Cox risk analysis, the recurrence rate of stroke was highly related to the severities of SCI (p=0.001), anti-platelets drugs used (p=0.037) and blood pressure control in the period of post first onset of stroke.

Conclusion
Our results demonstrated that: (1) silent cerebral infarction (SCI) can be found in 80-90% of aging subjects, and in 86.4% of patients with the first onset of ischemic stroke. (2) The present and the severity of SCI is highly associated with age, blood pressure control and the onset of ischemic stroke. (3) Both recurrence rate and the survival rate of stroke in three years be also highly associated with severe of SCI, hypertension control and anti-platelets drugs used.

Small Subcortical Infarct and Intracranial Large Artery Disease in Chinese

FP I-04

V. C. T. Mok[1], Y. H. Fan[1], W. W. M. Lam[2], A. C. F. Hui[1], K. S. Wong[1]
[1]Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Shatin, Hong Kong
[2]Department of Radiology & Organ Imaging, The Chinese University of Hong Kong, Shatin, Hong Kong

Background
Small subcortical infarct (SSI) occurs more frequently among Chinese than Caucasians. Apart from small vessel disease (SVD), atherosclerosis of the middle cerebral artery may cause branch occlusive disease and SSI. We aimed to study the frequency of SSI with and without intracranial large artery disease among Chinese acute stroke patients.

Methods
Magnetic resonance imaging (MRI), diffusion weighted imaging (DWI), and magnetic resonance angiography (MRA) were performed among consecutive Chinese stroke patients admitted to our acute stroke unit over a 6-month period.

Results
Among the 257 patients with ischemic stroke, 71 patients (27.6%) had SSI. Twelve patients (16.9%) had relevant intracranial large artery disease and 3 patients (4.2%) had lone relevant extracranial carotid artery disease. No patient had an identifiable cardiac embolic source. Excluding patients with relevant intra- and extra-cranial large artery disease, the prevalence of SSI associated with presumed SVD was 21.7%. Patients with SSI associated with intracranial large artery disease had a significantly greater number of acute infarcts and slightly greater stroke severity than those with presumed SVD.

Conclusion
Our present study suggested that the higher prevalence of SSI among Chinese might be in part related to a higher prevalence of intracranial large artery disease rather than to SVD.

High Yield of TCD Examinations in a Multi-racial Population

FP I-05

K. S. Tan[1], B. F. Sim[2], L. Praba[1], C. T. Tan[1], N. M. Ramli[1]
[1]Department of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia
[2]Gleneagles Intan Medical Centre, Penang, Malaysia

Background and Objectives
Transcranial Doppler ultrasound is a firmly established diagnostic technology in the investigations of cerebrovascular diseases. The transcranial Doppler ultrasound service under the Division of Neurology has recently been expanded at the University of Malaya Medical Centre, a tertiary level teaching hospital in Kuala Lumpur. 186 consecutive TCD examinations were performed in 2003 and these examinations were audited recently with several objectives including reviewing their indications, patient profile, referral source and the yield of the studies including those with TCD criteria for intracranial atherosclerotic disease.

Methodology
All TCD studies in original electronic storage were reviewed. All data were entered into the SPSS software (Version 9.0 for Windows). Subjects were classified according to pre-determined criteria as above.

Results
Indications for TCD in broad categories were strokes including subarachnoid haemorrhage, transient ischaemic attacks (TIA), meningitis, leucoaraiosis, pre-eclampsia as well as non-specific symptoms including dizziness. 167 (89.8%) of examinations were performed for strokes. A total of 127 TCD studies were performed for ischaemic strokes and TIA. 47% of stroke patients and 41% of all TIA patients were noted to have at least one arterial stenosis by TCD criteria. Intracranial stenosis was noted in all the three major racial groups. The overall yield of TCD studies was 66%. Other data including patient profile and referral source will also be discussed in the poster.

Conclusion
TCD is a useful and cost-effective diagnostic modality with good examination yield. The high percentage of our subjects with intracranial atherosclerotic disease is consistent with the published literature and was previously undocumented.

Primary Prevention of Ischemic Stroke – How and to What Extent?

FP I-06

T. S. Tse, K. L. Shiu, F. K. Hon, H. P. Shum, T. H. Tsoi
Department of Medicine, Pamela Youde Nethersole Eastern Hospital, Hong Kong

Background
Data from epidemiological studies and randomized trials have shown that interventions involving appropriate lifestyle/behavior changes and initiation of appropriate pharmacological treatment can modify various risk factors and thus reduce the risk of a first-ever ischemic stroke. Early identification of risk factors and optimal management of the respective risk factors with reference to standard guidelines can prevent the occurrence of stroke.

Objective
To evaluate 1) the risk factors that are present in patients presenting with first-ever ischemic stroke, 2) the patients' awareness of these risk factors, and the extent to which these risk factors are being managed before this episode of acute stroke, and 3) their implication in first-ever stroke prevention.

Methods
Patients with first-ever ischemic stroke admitted to Pamela Youde Nethersole Eastern Hospital from 1st November 2001 to 31st January 2002 were recruited in the study. Prevalence of different risk factors (both known and newly diagnosed risk factors) and standard of management of respective risk factor was studied. The standard of management of each well-documented modifiable risk factor was determined to be optimal or suboptimal according to the standard guidelines.

Results
Seventy-five patients were recruited in this study. Mean age was 72 ± 8.5 years (range 51 - 92), and the percentage of male patients was 42%. Twenty-one (28%) patients were smokers, and eight (11%) patients were ex-smokers. Only nine patients (12%) had regular physical activity.

Level of control of risk factors:

Risk factor (RF)	Known history of RF	RF under suboptimal control	Newly identified RF in index admission	Total numbers (and %) of patients with newly identified RF or RF with suboptimal control
HT	40 (53%)	25 (62.5%)	16	41 (55%)
DM	22 (29%)	10 (45%)	9	19 (25%)
DM with HT	17 (22%)	15 (88%)*		
AF	13 (17%)	11 (85%)	4	15 (20%)
Hypercholesterolaemia	7 (9%)	3 (43%)	21	24 (32%)

* If patient with DM and HT not receiving ACEI

75% of the patients had at least one risk factor under suboptimal control.

Conclusions
With better health care promotion, early risk factor identification and optimal management of risk factors, a substantial portion of first-ever ischemic stroke can be potentially prevented.

Pneumonia and Mortality in Acute Stroke Patients with Dysphagia

FP I-07

A. W. S. Chu[1], E. S. M. Poon[1], P. W. Ng[2]
[1]Speech Therapy Department, United Christian Hospital, Hong Kong
[2]Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong

Objective
To study the prevalence of dysphagia among acute stroke patients and its effect on pneumonia incidence and stroke outcome.

Method
All patients admitted into the acute stroke unit were assessed with a bedside swallowing screening for dysphagia on admission and those who failed the test were referred to the speech therapist for evaluation. All patients were prospectively followed up for one year after stroke for the occurrence of pneumonia, discharge destination and mortality. The association between the outcome events and dysphagia was calculated.

Results
A total of 261 acute stroke patients were admitted into our acute stroke unit during the period from July to November 2001. Patients who were unconscious (21 patients) or had other neurological diseases and/or malignant tumour (11 patients) were excluded. All patients were assessed with a bedside swallowing screening test on admission. Clinically 80/229 (34.9%) patients were identified with dysphagia, and 77 of them were referred to speech therapist for management during the acute and rehabilitation phase of the stroke. Twenty-six patients (32.5%) have the dysphagia resolved within 14 days. Incidence of dysphagia was significantly higher in the older age group (≥75 years old) ($p=0.016$), but no association was found with sex and location of stroke. All stroke patients were followed up for one year post stroke for outcomes and data was available for 207 subjects regarding the occurrence of pneumonia, death and discharge destination. Presence of dysphagia was found to have positive association with discharge to old-aged homes (39.7% vs 6.5%, RR=6.1, $p<0.0001$), occurrence of pneumonia (19.1% vs 8.6%, RR=2.2, $p=0.03$) and mortality (10.3% vs 2.9%, RR=3.6, $p=0.043$) (confidence interval at 95%). After adjusting for age, logistic regression analysis showed that presence of dysphagia is no longer significantly associated with occurrence of pneumonia ($p=0.113$), but remained significantly related to the discharge destination ($p<0.0001$) and mortality ($p=0.04$).

Conclusion
Dysphagia is common after acute stroke and could lead to undesirable outcomes. Early identification and appropriate management is essential to prevent complications.

Intracranial Arterial Stenosis in Atherothrombotic Middle Cerebral Artery Territory of Chinese Patients

FP I-08

M. W. Lo, W. C. Fong
Queen Elizabeth Hospital, Hong Kong

Background and Purpose
A prospective study was conducted to examine the arterial pathology, the angiographic appearances of intracranial stenosis and topographical stroke patterns in patients with atherothrombotic stroke in the MCA territory.

Methods
We studied 51 patients admitted to a community hospital in Hong Kong suffering from atherothrombotic MCA territory infarct from January 2003 to October 2003. MR imaging (T1, T2 and diffusion weighted imaging) and angiography were performed. Cases of cardioembolic stroke were excluded. The distribution and degree of steno-occlusive lesions were identified. Logistic regression analysis was performed to look for any predictor of steno-occlusive disease. Topographical stroke patterns were analyzed with regard to the underlying steno-occlusive pathologies. MRA appearances of the intracranial stenotic arteries were evaluated according to likelihood of successful angioplasty.

Results
For all patients, 53% of them had radiological MCA diseases. 20% had extracranial disease. Amongst the patients with non-lacunar infarct, 61% of them had intracranial diseases and 24% had extracranial diseases. For those with radiological lacunar infarct, 20% had intracranial diseases. None of them had extracranial disease. Hypertension was found to be an independent predictor of intracranial stenosis in logistic regression model (OR=0.175, 95% CI 0.041-0.745; P=0.018). MCA was involved in more than 50% of cases for every topographical stroke patterns. More than half of the patients (57%; 8 in 14 patients) with stenotic MCA lesions had short, concentric and non-angulated lesions, which were associated with favorable clinical outcome for patients undergone intracranial angioplasty.

Conclusion
Symptomatic intracranial stenosis was present in over half of the patients with MCA territory infarct. MCA steno-occlusive disease was the most important cause of infarction in the MCA territory giving rise to lacunar infarction and many other topographical stroke patterns. More than half of the patients with MCA stenosis had favorable angiographic appearance, which might be amenable to intracranial angioplasty.

Thrombolysis – Where We Are

LS-01

W. Hacke
University of Heidelberg, Germany

After approval of thrombolytic therapy in the USA, Canada and Germany, decisions for wider approval of i.v. t-PA in a three hour time window are still pending. While the individual study basis for i.v. rt-PA is in public domain for quiet a while, there are new aspect of intravenous thrombolysis, on which this presentation will focus. They include

1. results from combined analysis of 6 rt-PA trials (ATLANTIS A and A, ECASS I and II and NINDS part I and II)
2. the usefulness of MRI assisted patient selection
3. new developments to enhance the efficacy of thrombolytic therapy with focus on new devices and combination therapies
4. Results from recent trials such as DIAS and AbESTT

Japanese EC-IC Bypass Trial (The JET Study)

SM II-01

A. Ogawa, JET study group
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It has not been proven whether EC-IC bypass surgery is effective for prevention of stroke recurrence or amelioration of neuropsychological function. To answer these questions, Japanese EC-IC bypass trial (JET study) has been started since 1998. This study is well designed to evaluate efficacy of EC-IC bypass surgery as a RCT at the level I study of the evidence-based medicine. In this paper, we indicate several solutions to suppress bias hidden in the each step in JET study and important points to organize this type of clinical study, which refine the study design more scientifically.

The subjects of this study were 206 patients who have been listed for 40 months from November 1st 1998 to March 31st 2002. In interim analysis, the 2-year follow-up study has been completed for 182 patients (90 in the medically-treated group and 92 in the surgically-treated group). Seventeen patients in the medically-treated group and seven in the surgically-treated group reached primary endpoint. Risk reduction of primary endpoint was 59% by surgery. Risk reduction of stroke recurrence in the surgically-treated group was 73%. It was significantly lower ($p=0.032$). We checked 47 items of 6 neuropsychological tests. In the medically-treated group, 8 items was improved, while the remaining 39 items exhibited no change at 2-year follow-up. In the surgically-treated group, 17 items were improved and the remaining 30 items exhibited no change. Although these results are preliminary and at the halfway stage, it appears that surgical treatment yields better improvement of neuropsychological function than medical treatment.

Results

The study has been running smoothly, and we will reach the final goal at the end of March 2004. I would like to emphasize that the clinical study will be organized at the higher evidence level as JET study had been done.

Controversies in the Treatment of Carotid Stenosis: Endarterectomy Versus Stenting

SM II-02

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Atherosclerotic carotid disease is increasing in number in Japan. We have experienced carotid endarterectomy over 230 cases with surgical mortality and morbidity of less than 2%. We have recently introduced carotid stenting in case of "high-risk" patients with minimal risk. From these experiences, I will discuss about advantages and disadvantages of both procedures.

Our endarterectomy was carried out without catheter angiography but with 3D-CT angiography (CTA) and ultrasound echo imaging. 3D-CTA gives us adequate preoperative information for endarterectomy, and the finding of 3D-CTA correlated well with pathological findings. The weak part of endarterectomy includes patients with cardiac and systemic complication and highly positioned lesions. For those lesions, carotid stenting is much easy to proceed. Carotid stenting is however, not applied for highly calcified lesion, and 3D-CTA was useful for preoperative evaluation.

Prospective non-randomized study for carotid disease (Japan Carotid Atherosclerosis Study: JCAS) is a government-supported study under direction of Dr. Endo (Toyama, Japan), and 565 cases are enrolled since January 2003. Part of the results will be discussed.

Nutritional and Metabolic Risk Factors for Stroke

SM III-01

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The potential for stroke risk reduction by nutritional means is greater than commonly recognized in medical practice and public health programmes. The risk factors include:

(1) Obesity, including abdominal obesity
(2) Alcohol
(3) Low plant food intake
(4) High sodium/potassium molar ratio (preferably not greater than 1.0)
(5) Homocysteinaemia, dependent on micronutrient intakes (B-6, folate, B12)
(6) Impaired fasting glycaemia and diabetes
(7) Hyperlipidaemia

The extent to which secondary prevention and treatment can recruit these understandings from primary prevention varies from risk factor to risk factor and requires more definitive study, as does the relationship amongst risk factors. In the meantime, food based (FB) approaches to stroke prevention are worthy of more active promotion.

Management of Stroke – Asian Perspectives

DS-01

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Stroke is the commonest cause of hospital stay in Hong Kong. It is also one of the leading cause of death and dementia in Asia. Yet relatively little data are available regarding the whether the results of stroke trials can be generalized to the Asian population.

The pathophysiology of stroke in Asians is slight different. There is more intracerebral hemorrhage (20-50%) in Asians when compared with Caucasians (10-15%). For large artery atherosclerosis, the commonest location of lesions is in the intracranial arteries rather than the extracranial carotid artery. Moreover, small vessel diseases are also more common in Asians.

The difference in the pathophysiology may somewhat affect the management of stroke. For patients with atrial fibrillation, the Japanese tends to use a lower range of INR. In the use of tPA for acute ischemic stroke within 3 hours, there are concerns whether the rate of hemorrhagic transformation of infarct is higher. Thus post marketing survey of serious adverse events may be important in Asia.

Advances in Hyperacute Treatment of Stroke

DS-02

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Hyperacute therapy of Ischemic Stroke includes preclinical and in hospital aspects. Preclinically, patients have to be transported to an expert center with no delay. A well organized EM-system is essential. Within the center, special written guidelines must in place that allow speedy evaluation and management of the patients. Early management in the emergency room includes standard basic medical therapy aiming at best physiological state of the patient and correction of vital parameters.

Neuroimaging is essential. Within the three hour time window, specific therapy options are available. The results of thrombolytic therapy, the time dependency of its efficacy, and specific approaches to enhance the time window will be discussed. In some instances, specific critical care options such as hypothermia and decompressive surgery may be essential. Acute treatment of stroke has nowadays received much more interest than previously, and the results are convincing.

Current Evidence and Future Trends of Secondary Prevention Therapy

DS-03

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In many ways stroke and myocardial infarction (MI) are similar: They are both major causes of morbidity and mortality, occur with a high frequency in the elderly, and share a common pathophysiology – atherosclerosis. In other ways, however, stroke and MI are not similar, and stroke patients are more susceptible to having another stroke as their next major vascular event, and MI patients another MI rather than a stroke as the next major vascular event.[1] This fact has led to debate regarding the best outcome endpoint in stroke clinical trials: recurrent stroke, or a combined endpoint recurrent stroke, MI and vascular death.[2] It might also have an effect on the selection of the best strategy for prevention of secondary ischemic events.

Various drugs are currently used for secondary stroke prevention, e.g. acetyl salicylic acid (ASA), ticlopidine, clopidogel and ASA plus dipyridamole[3] and several conventions and forums focus on the best strategies for stroke prevention.[4,5] In patients with transient ischemic attacks (TIAs) or ischemic stroke of noncardiac origin, antiplatelet drugs are able to decrease the risk of stroke by 11% to 15%, and decrease the risk of stroke, MI and vascular death by 15% to 22%. The worldwide accepted minimal standard treatment with ASA leads to a moderate but significant reduction of stroke, MI, and vascular death in patients with TIA and ischemic stroke. Since low doses are as effective as high doses, but are better tolerated in terms of gastrointestinal side effects, the recommended ASA dose is between 50 and 325 mg. Bleeding complications are not dose-dependent, and also occur with the lowest doses. Ticlopidine is effective in secondary prevention of stroke, and for some endpoints it is superior to ASA. However, due to the side-effect profile (neutropenia, thrombotic thrombocytopenic purpura) its use must be restricted to patients intolerant of ASA. Clopidogel has a better safety profile, is applied in patients intolerant for ASA and is the first-line treatment for patients with stroke and peripheral artery disease or MI.

A combination of drugs bridging the gap between conventional inhibition of platelet with function and modern interaction vessel wall dysfunction - twice daily 25 mg ASA and 200 mg slow-release dipyridamole, as available in Aggrenox^{R} - is superior for stroke prevention when compared to ASA[6]: An impressive 23% reduction in stroke recurrence and a 21% reduction in stroke, MI, and vascular death was achieved with this combination over ASA alone. This level of improvement cannot be explained by a more profound inhibition of the hemostatic system, since the risk for bleeds was very low for the combination as well as for dypyridamole alone. The combination has therefore found a "front row seat" in many guidelines for stroke prevention, and is recommended as first-line treatment, e.g. by the European Stroke Initiative.[7]

In order to optimize the strategy for stroke prevention and additionally consider the prevention of other vascular complications a combination with other drugs for modification of risk factors seems timely and should be explored. In this line of argument the combination of ASA/dipyridamole and telmisartan, a selective angiotensin receptor blocker, seems to be the next logical step.[8] PRoFESS will address the head to head comparison of ASA/dipyridamole versus ASA/clopidogel and 50% of each group will also receive telmisartan in a factorial design involving 15.500 stroke patients. All patients will be controlled for their blood pressure prior to entering the study in order to elucidate the additional effects angiotensin receptor blockade might have besides the lowering of blood pressure. PRoFESS therefore might be seen as an extension of the concept of correcting vessel wall dysfunction by further inhibiting angiotensin mediated endothelial dysfunction. PRoFESS is one of the ongoing and planned trials in long-term management of patients with cerebrovascular disease[9] which combines different modes of action and which will set new standards of care for patients at risk of stroke.

References

1. Vickrey, B.G. et al.: Stroke 2002, 33: 901-906
2. Albers, G.W.: Neurology 2000, 54: 1022-1028
3. Antithrombotic Trialists' Collaboration: BMJ 2002, 324: 71-86
4. Easton J.D. et al.: Neurology 1999, 53 (suppl. 4): S 32-S37
5. Diener, H.C. and Ringleb, P.: Curr. Treat. Options Cardiovasc. Med. 2002, 4: 429-440
6. European Stroke Prevention Study 2: J. Neurol. Sci. 1997, 151(suppl.): S1-S77
7. Leys, D. et al.: Cerebrovasc. Dis. 2004, 17 (suppl.): S15-S29
8. Progress Collaborative Group: Lancet 2001, 358: 1033-41
9. Hankey, G.J.: Cerebrovasc. Dis. 2004, 17 (suppl.): S11-S16

The Way into a New Class of Antithrombotic Drugs

DS-04

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In our current understanding of treatment and prevention of acute vascular events, thrombolytic as well as antithrombotic treatment are the major cornerstones. Lysis of clot particularly soon after the event has shown to be significant step forward in revascularization and re-establishing blood flow leading in many cases to a significant if not complete reversal of symptoms. Preventive treatment by "blood thinning" treatment, i.e. the use of either inhibitors of platelet of inhibitors of the clotting cascade have shown to be almost equally effective but seemed to be limited to the extent of its clinical benefit, regardless of dose or compound used. Stronger inhibition of either platelets or the clotting cascade has shown to be correlated with increasing risk of bleeds, which particularly in treating stroke patients needs to be kept as low as possible.

It is therefore very attractive to activate or amplify endogenous antithrombotic mechanisms or to utilize additive or even synergistic antithrombotic activities with other medication given for other reasons to these patients.

There are a number of mechanisms shown to prevent thrombus formation, which are utilized in modern stroke prevention.

It was recently shown, that presumably by stabilizing the asymmetry of the outer cell membrane the formation of thrombin – the key motor in thrombus formation – can be significantly inhibited. Likewise the reduction of pro-inflammatory cytokines from the interaction of platelets with monocytes as well as the increase of t-PA release have to be considered important "antithrombotic" effects, which do not involve a direct and in most cases irreversible blockade of the hemostatic system.

By interfering with the rapid amplification of the thrombotic cascade mainly through effects by the vessel wall rather than by just blocking platelets irreversibly to a varying degree, apparently an even greater clinical benefit can be achieved without increasing the risk of bleeding complications.

These properties as well as a more general down regulation of pro inflammatory and pro-thrombotic receptors under chronic treatment seems to place Aggrenox into a new category of preventing vascular complications and disease without directly blocking platelets or the clotting cascade. May be this should be considered the prototype of antithrombotic treatment without increasing the risk of bleeding complications and renamed "vascular protecting agent".

Epidemiology of Stroke and Community-based Intervention Trial in China

SM IV-01

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Objective

To investigate the distribution on morbidity and mortality of stroke in China and to explore the effective and suitable measures for lowering incidence and mortality of stroke in community population.

Methods

Two large-scale and door-to-door surveys were carried out in 7 cities and in 21 rural populations in China between 1983 and 1985, and a community-based comprehensive intervention trial was conducted among 300,000 populations in three urban communities in Beijing, Shanghai and Changsha in 1990s. The latter study was divided into intervention and control groups in each city.

Results

The average prevalence, incidence and mortality of stroke in urban population were 719/100,000, 219/100,000 and 116/100,000 respectively. The average prevalence, incidence and mortality in 21 rural areas were 394/100,000, 185/100,000 and 142/100,000. Geographic differences were found significantly from the two surveys. Morbidity and mortality of stroke in populations in the north were remarkably higher than that in southern part of China. The results of community-based intervention trial revealed that the incidence and mortality of stroke decreased by 52.0% and 53.6% in intervention community between 1991 and 2000. During the same period, incidence and mortality of stroke in control community only decreased a little. It showed a statistically significant difference between the two groups.

Conclusions

Stroke has been the first leading cause of death in the northern part of China in recent years. The incidence and mortality of stroke ranked front compared with other countries. Using comprehensive measures to prevent and manage patients with hypertension together with a regular education and health promotion activities in community population could evidently reduce the incidence and mortality of stroke.

Treatment of Small Intracerebral Bleedings

SM IV-02

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Introduction

Small intracerebral bleedings (ICH) are treated conservatively, but there is no agreement on how to treat these small ICH (< 30 cc).

Methods

All patients with small ICH who came to the university hospital and private clinics of the author were asked to participate in a double-blind placebo-controlled trial. The trial started January 1, 1999 and ended January 1, 2003. Only patients who came within 12 hours after the first symptom were admitted into the trial. An informed consent was obtained. The diagnosis of ICH was based on clinical examination and CT scan. Excluded were cerebellar bleedings and hemorrhage into the pons. Six patients refused to participate. The remaining 250 patients were randomized into two groups, one group received 250 mg citicholine four times a day, the other group received isotonis saline. The doctors, nurses and patients did not know, which ampules contained citicholine and which isotonic saline because both were identical and colorless. The intravenous injections were given for ten days. Both groups received ramipril and tranexamic acid in low dose. Three functions were observed: functional outcome (Barthel Index), neurological evaluation (NIH Stroke scale) and cognitive function (Mini Mental state Examination).

Conclusion

The trial suggested that the use of citicholine intravenously in small ICH will significantly improve functional outcome ($p<0.05$), neurologic evaluation ($p<0.05$) and cognitive function ($p<0.05$). Citicholine is probably working as a neuroprotective drug.

Thrombolytic Therapy in Taiwan

SM IV-03

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Cerebrovascular diseases are the second leading cause of death in Taiwan, among which 72% are of ischemic stroke. Recombinant tissue plasminogen activator (rt-PA) has been approved for the treatment of acute ischemic stroke since 1996. However, due to its eligibility criteria and the potential bleeding side effects, the use of rt-PA has been limited to a low percentage of acute ischemic patients in all countries. We had collected the patients received IV rt-PA according to the guidelines of American Heart Association in Taiwan. The drug was given within 3 hours of stroke onset. Thirty-four patients, 13 men and 21 women, were treated in 6 hospitals. The mean age was 67.1 years old. The dose of rt-PA was 0.6-0.9 mg/kg. Intracranial hemorrhage (ICH) occurred in 4 patients (11.7%), including 2 (5.9%) symptomatic ICH. The mortality rate was 26.5% at 3 months. The NIHSS scores at baseline, Day 1, Day 7 and 3 months were 19.9, 17.2, 13.5 and 8.7 respectively. There were 15 dependent and 10 independent patients during the observation period. The severity of this group of patients were worse than most of other studies. More registration of patients treated by this therapy for the safety and efficacy is important in Taiwan.

In order to increase treatment patients with thrombolytic therapy, we try to find a thrombolytic agent that may allow a wilder treatment-time window. Human Tissue Urokinase Type Plasminogen Activator (HTUPA), a novel thrombolytic agent, is constructed by inserting the single kringle region of urokinase into the beginning of the double kringle region of tissue plasminogen activator. We conducted an open-label and dose-finding study to evaluate the safety of HTUPA in patients with acute ischemic stroke within 5 hours after the symptom onset. Thirty-four patients (21 male and 13 female) with an average age of 69 were enrolled. 29 patients received 0.3 mg/kg, 2 patients 0.35 mg/kg and one patient 0.4 mg/kg. 2 patients withdrew from the study before giving HTUPA. The total dose given ranged from 15.8 to 29 mg per patient. The results showed that ICH associated with deteriorating symptom was only observed in one patient who received 0.4 mg/kg. Five patients (17%) treated with 0.3 mg/kg were detected asymptomatic ICH at 24 hours after the study medication. About 40% of patients treated with HTUPA recovered completely or could be independent in daily activity. The safety profile of HTUPA was acceptable when given at a dose of 0.3 mg/kg to treat acute ischemic stroke within 5 hours after the symptom onset. The effect of HTUPA in the treatment of patients with acute ischemic stroke warrants further investigation.

Reassessment of Defibrase in the Treatment of Acute Cerebral Infarction

SM IV-04

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Objective
To further assess the efficacy and safety of defibrase in patients with acute cerebral infarction by a large sample, multicenter, randomized, double-blind, and placebo-controlled clinical trial.

Methods
1029 cases with acute cerebral infarction in 48 centers were randomly allocated to receive either an initial intravenous infusion of defibrase 15 IU or placebo in 250 ml of normal saline within 12 hours of stroke onset. Subsequent infusions of defibrase 5 IU or placebo on the third, fifth, seventh and ninth days respectively. This treatment protocol was determined on the bases of the first stage study (Feb, 1998-Sept, 1999) and two pretrials of 64 patients in 11 centers. The end points included Modified Scandinavian Stroke Scale (MSSS), Barthel Index, Mortality, recurring rate of stroke and adverse reaction.

Results
(1) The level of plasma FIB in the defibrase group declined from mean 334.10 mg/dl before administration to mean 129.94, 141.26, 136.21, 140.91, 143.79 mg/dl respectively on 24h, and fourth, sixth, eighth, tenth days after treatment. (2) MSSS score and Barthel Index had more remarkably improvement in the defibrase group than in the placebo group at 14 days after treatment (mss 9.7 VS 11.72, P=0.003, BI 69.10 VS 65.15, P=0.048), although BI was higher in the defibrase group than in the placebo group at 3 months, but no statistically significant differences (72.94 VS 69.70, P=0.212). (3) The mortality was higher in defibrase group than in the placebo group at 3 months, 5 cases in the defibrase group, 2 cases in the placebo group died from symptoms intracranial hemorrhage. (4) Intra- and extra-cranial hemorrhages were present in 30 cases of defibrase-treated patients and 16 case of placebo group. Out of them, 12 cases in defibrase group and 8 cases in placebo group were intracranial hemorrhages.

Conclusion
Defibrase can improve functional status in the patients with acute cerebral infarction by adjusting doses, treating time window and duration. But it tends to increase hemorrhagic events.

Intracerebral Haematoma: Operative Versus Non-operative – Local Experience

FP II-01

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Background
Spontaneous supratentorial intracerebral haemorrhage (ICH) accounts for 10-30% of all strokes resulting in a high mortality and major morbidity. Although guidelines for medical treatment and surgical intervention for ICH are available, selection of patients for surgery in this group of patients is controversial and varies greatly throughout the world.

Objective
In this study, we aim at reviewing our selection criteria for treatment and their management results.

Methods
We had prospectively collected the data of patients admitted to our centre with spontaneous supratentorial ICH in a two-year period (January 2001-December 2002). We divided them into three main groups according to the anatomical site: putaminal, subcortical and deep basal ganglia. Surgical treatment was limited to patients aged below 65 years, with clot size between 30 and 100 ml, and motor scores of normal flexion to localizing to pain.

Results
One hundred and twenty-four patients were recruited in this study. Thirty-four patients managed by early surgery had 18% mortality, 29% were independent and 53% dependent at six months. Early surgery for subcortical haematoma carried the best prognosis (42% achieved independence) whereas deep basal ganglia haematoma carried the worst prognosis (none achieved independence).

Conclusions
Although this prospective audit was not intended to be a case-control study, our data support early surgery for patients with putaminal and subcortical haematomas with clot size larger than 50 ml. For smaller haematoma of less than 30 ml, conservative management is associated with a superior clinical outcome.

Carotid Endarterectomy under Regional Anaesthesia (RACE)

FP II-02

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Introduction
Carotid endarterectomy (CE) is the preferred treatment of severe carotid artery stenosis (CS) while carotid angioplasty and stenting (CAS) is an alternative if not suitable for CE. While technique and safety of CAS is improving, much effort is also paid to reduce the complication rate for CE.

Purpose
We started to use RACE for all patients with increased cardiac risk and as an option for other patients since 2001. The aim is to assess the safety and effectiveness of RACE.

Methods
This is a prospective observational study. A total of 12 RACE performed. Six of the patients had one or more medium AHA risk predictor(s).

Results
None of the cases need to be converted to GA. There was no operative stroke, mortality, or cardiac ischaemic events. Length of stay (LOS) after CE or CAS in our hospital is as follows:

Post-op LOS	RACE (13 cases)	CE under GA (53 cases)	CAS (11 cases)
Mean (days)	3.8	5.4	5.5
Median (days)	3	4	4

After the introduction of RACE very few of the cases were indicated for CAS.

Conclusions
Introduction of RACE led to improvement in outcome and reduced the LOS following treatment of CS.

Clinical Relevance of Severe Initial Hypertension in Acute Intracerebral Haemorrhage

FP II-03

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Objective
To characterise severe initial hypertension (SIH) in the acute intracerebral haemorrhage (ICH) and the related clinical outcomes.

Methodology
We prospectively identified patients admitted to a regional hospital with acute ICH between January 2003 and September 2003. SIH was defined by systolic BP >180 mmHg, diastolic BP >105 mmHg and/or mean BP >130 mmHg for 2 or more readings at 10 or more minutes apart. Clinical data was recorded and analyzed. The modified Rankin score was used to assess disability.

Results
A total of 102 patients were identified. SIH was found in 72 patients (70.6%). Comparing those with SIH and those without SIH, they differed statistically in Glasgow Coma Scale ($p=0.03$), National Institutes of Health Stroke Scale ($p<0.001$), volume of ICH ($p=0.006$), past history of hypertension ($p=0.03$) and time from onset to hospital arrival ($p=0.013$). Patients with SIH had a statistically significant increase in 30-day mortality ($p=0.028$) and 3-month mortality ($p=0.016$) as well as increase in 30-day disability ($p=0.003$) and 3-month disability ($p=0.006$). However, the correlation between SIH and mortality or disability was lost when controlling for the above factors. Furthermore, about half of the patients with SIH had their BP subsided within the first day, and this was associated with a significantly lower 30-day disability ($p=0.033$) and 3-month disability ($p=0.045$).

Conclusion
SIH in acute ICH is related to a poor neurological state, an increased volume of ICH, a past history of hypertension and a shorter delay from onset. SIH is a prognostic indicator for mortality and disability but is not an independent factor. As those with early settle of BP have a lower disability, aggressive BP control in the acute phase of ICH may lessen the morbidity.

Cerebral Revascularization for Moyamoya Disease: Encephaloduroarteriomyosynangiosis (EDAMS) Operation and the Results

FP II-04

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Since 1996, we performed 11 Encephalo-duro-arterio-myo-synangiosis (EDAMS) operations for 8 patients (bilateral operations for 3 cases) with Moyamoya disease. They were 5 children and 3 adults, age from 2 to 9 years for the children and 20 to 43 years for the adults. All presented with cerebral ischemia or infarction except one adult case with cerebral haemorrhage. After EDAMS, all TIA stopped, and there were good revascularization to the middle cerebral artery (MCA) branches on Magnetic Resonance Angiography (MRA) and significant improvement of MCA territory blood flow on post-op cold Xenon CT. Two patients developed TIA as the result of contralateral cerebral ischaemia without infarction; EDAMS of the other side was carried out in these two patients resulting in resolution of the new TIAs. EDAMS is a safe and effective operation for paediatric Moyamoya disease with cerebral ischemia. It is effective for young adult patients too in our limited cases. The patients required long-term follow-up for the progress of the disease. MRA and cerebral blood flow study are objective and non-invasive tools in the follow up of surgical results and progress of the disease.

Treatment of Ruptured Anterior Communicating Artery Aneurysm

FP II-05

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Introduction
The practice model of case-by-case evaluation by a combined microsurgical and endovascular team based on the individual characteristics of each ruptured intracranial aneurysms, is the model used in most neurovascular centers in the US and in our center. We aim to audit the outcome and cost (in terms of intensive care unit stay and hospital stay) in the microsurgical treatment group and endovascular treatment group.

Method
The records of patients having ruptured anterior communicating artery aneurysm admitted to our unit between 1996 and 2002 were reviewed. A total of 54 patients were reviewed. 27 patients had endovascular treatment and 27 patients had microsurgical treatment.

Result
The profiles for age, sex and admitting WFNS grading and Fisher grading were similar between the endovascular treatment and microsurgical treatment groups. 2 patients in the endovascular group and 1 patient in the microsurgical group need further treatment for recurrent aneurysm. The mean intensive care unit stay is 7 days for the microsurgical group and 5 days for the endovascular group (P=0.40). The mean hospital ward stay is 20 days for the microsurgical group and 27 days for endovascular group (P=0.31). Favorable outcome was achieved in 70% of patients in one year in both groups of patients.

Conclusion
The outcome in both microsurgical and endovascular groups is satisfactory. There is no difference in terms of outcome and cost analysis between the two groups. The practice model of case-by-case evaluation by a combined microsurgical and endovascular team based on the individual characteristics of each ruptured intracranial aneurysm should be continued.

Stroke Caused by Cerebral Venous Thrombosis: Experience in Diagnosis and Treatment

FP II-06

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Background
Cerebral venous thrombosis (CVT) was thought to be a rare disease entity. However, with the advance in diagnostic technology and heightened clinical alertness, an increased number of cases are being reported, particularly in young stroke patients.

Method
We summarize and analyse 13 patients encountered in our service, including their presentations, treatment regimes and final outcomes.

Results
The average age was 35 years old with female predominance (10 female, 3 male). Their presentations varied from just persistent headache to epilepsy, intracerebral haemorrhage/infarct and papilloedema. Suspected precipitating factors (contraceptive pill, pregnancy, transamine and thyrotoxicosis) were noted in three patients. Haemotological disorder was reported as common in Chinese. Diagnostic investigations were either MR venogram or cerebral DSA. The majority achieved a good outcome with improvement or resolution of the presenting symptoms and/or deficits. However, two patients died secondary to uncontrolled raised intracranial hypertension. Most patients were treated with heparin or low-molecular weight heparin. Two cases needed ICP monitoring and one required a decompressive craniectomy as well as local intravenous thrombolytic therapy. One patient needed long-term anticoagulation with warfarin because follow-up scanning demonstrated failure of the venous complex to re-canalize.

Conclusion
CVT may present in numerous ways. A high level of clinical suspicion and early diagnosis particularly in young stroke patient can improve outcome and decrease morbidity and mortality, particularly when there are oedema or haemorrhage around cerebral venous sinuses and patient has convulsion. Absence of classical risk factors does not exclude CVT and previous venous thrombosis at other site increase the risk.

Management of Risk in the Prevention of Stroke

LS II-01

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Asian populations show a particularly steep association between systolic blood pressure (BP) and cerebrovascular events: a 10 mmHg lower systolic BP is associated with an approximately 50% lower rate of strokes at 50–59 years of age and an approximately 25% lower rate at 70–79 years of age.[1] Consistent benefits with BP lowering have been demonstrated in clinical trials in Western and Asian populations. The synthesis of all clinical trials through meta-analyses and systematic overviews indicates that the benefits of different classes of anti-hypertensive agents for lowering stroke rates are largely related to the extent of BP lowering. These benefits appear somewhat larger with dihydropyridines and less with ACE-inhibitors.[2] For example, in the Black participants of Antihypertensive and Lipid-Lowering treatment to prevent Heart Attack Trial (ALLHAT) on lisinopril-based treatment, the BP was 4–5 mmHg higher and stroke rates 40% higher as compared to the Blacks in the diuretic-arm, whereas on the dihydropyridine amlodipine the BP was 1 mmHg higher and stroke rates 7 % lower.[3] In European Trial on Reduction of Cardiac Events with Perindopril in Stable Coronary Artery Disease (EUROPA) and Perindopril Protection Against Recurrent Stroke Study (PROGRESS), treatment with perindopril lowered systolic BP by 5 mmHg but did not lower stroke rates compared to placebo.[4,5]

Angiotensin receptor blockers have been proposed to provide more specific protection against stroke. This concept is based on Losartan Intervention For Endpoint reduction in hypertension (LIFE), which unfortunately used as comparator atenolol that in older hypertensives may not lower the risk of either strokes or MI. A better assessment of this concept may come from Valsartan Antihypertensive Long-term Use Evaluation (VALUE), which compares valsartan- with amlodipine-based treatment.

References

1. Asia Pacific Cohort Studies Collaboration. J Hypertension 2003;21:707–716.
2. Blood Pressure Lowering Treatment Trialists' Collaboration. The Lancet 2003;362:1527–1535.
3. The ALLHAT Officers and Co-ordinators for the ALLHAT Collaborative Group. Major outcomes in high-risk hypertensive patients randomized to angiotensin converting enzyme inhibitor or calcium channel blocker vs diuretic. The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). JAMA 2002;288:2981-2997.
4. Efficacy of perindopril in reduction of cardiovascular events among patients with stable coronary artery disease: randomized, double-blind, placebo-controlled, multicentre trial (the EUROPA study). The Lancet 2003;362: 782-788.
5. PROGRESS Collaborative Group. Randomised trial of a perindopril-based blood-pressure lowering regimen among 6105 individuals with previous stroke or transient ischaemic attack. The Lancet 2001;358:1033-1041.

Clinical Characteristics and Surgical Results of 2086 Patients with Cerebral Arteriovenous Malformation

SM V-01

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Objective
A series of 2086 patients with cerebral arteriovenous malformations (AVMs) were reviewed and 635 patients underwent surgical treatment after 1992. Clinical characteristics and surgical results of patients with cerebral arteriovenous malformations (AVMs) were assessed.

Methods
Collected data of 2086 consecutive AVM patients from January 1956 to October 2001 were analyzed. The size of the AVMs ranged from 1 cm to 9 cm. Patients underwent surgical treatment were divided into two groups by date of admission: one was from 1992 to 1996 and the other was from 1997 to 2001. The variables assessed for clinical characteristics in our study included: age (at diagnosis), sex, Spetzler-Martin grade, first presentations. The surgical results were assessed by compared the surgical complications between the two surgical groups. Difference between the two groups was assessed by χ^2 test.

Results
Cerebral AVMs are more commonly diagnosed at age of 20 to 40 years. Hemorrhage (43.4%), headache (24.9%) and seizure (17.3%) were the first three common presentations. There was no difference in age distribution and sex ratio between the two surgical groups. Regarding Spetzler-Martin grading system, the percentage of grade 3 to 5 patients increased while that of grade 1 and 2 patients decreased (P=0.00). But the incidence of main surgical complications (death, hemiparalysis, cranial nerve dysfunction and gastrointestinal hemorrhage) was same (P= 0.796).

Conclusions
Cerebral AVM is one of the important reasons for the spontaneous intracranial hemorrhage in young patients. Spetzler-Martin grading system is helpful to predict the surgical risk. Microsurgical technique has made surgical treatment safer and become the best choice for cerebral AVM patients. Combination of intraoperative embolisation with surgical resection is a practical method in treatment of giant cerebral AVMs.

Stem Cell Research in Stroke

SM VI-01

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Stroke is one of the leading causes of death and disability in the most countries. A lot of efforts have been made to reduce the nervous system damage in patients with acute stroke. However, with the only exception of thrombolysis using rtPA, clinical trials have been in vain to investigate a variety of neuroprotective agents showing effects in experimental researches.

The nervous system has limited capacity in self-repair since the mature neurons lack the ability to regenerate. As it has been recently known that neural stem cells (NSCs) exist and neurogenesis may occur even in adult brain, new approaches using stem cells are under study to replenish functional deficit in stroke.

In global or focal brain ischemia models of rats, we have transplanted Lac-Z containing human NSCs (HB1.F3 cell line) isolated from fetal telencephalon in ischemic models of rats via tail vein. And we evaluated migration and differentiation of NSCs in the damaged brain and assessed functional improvement after transplantation.

Transient global brain ischemia was induced for 10 minutes in adult rats followed by intravenous transplantation of NSCs 24 hours later. We could find NSCs migrated to the damaged hippocampus and cortex, which populated in CA1 and dentate gyrus more densely at day 7 and after. Also co-labeling study using GFAP, NeuN, NF, and b gal showed the transplanted NSCs have differentiated into neurons and astrocytes.

In focal ischemia model, MCA was occluded for 1 hour followed by reperfusion. NSCs were injected via tail vein 24 hours after ischemia. Transplanted NSCs migrated to the peri-infarct cortex and striatum, the density of which prominently increased at day 14. Immunoreactivity study also revealed the differentiation of the NSCs into neurons and astrocytes. Behavioral studies showed significant functional improvement in transplanted rats comparing with the control.

Our studies suggest NSC transplantation would be a new therapeutic approach to repair the damaged brain and replenish functional deficit after stroke not to protect the brain from acute ischemic damage.

Health Promotion in Stroke Prevention

SS-01

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This presentation will first briefly highlight the scale and severity of stroke and its related risk factors. How those risk factors have been dealt with using health promotion interventions and what evidence of effectiveness is available will then follow. The presentation will conclude with the lessons learnt from those interventions and opportunities for further actions.

The Role of a Psychologist in Stroke Prevention and Care

SS-02

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Stroke is known as one of the most preventable of all life-threatening health problems. Though there are some risk factors that cannot be changed, there are many factors that can reduce the risk of stroke. Among others, a healthy life style is the best protection against stroke. Effective coping of stress is an important healthy life style change that can directly affect those controllable risks of high blood pressure, high risk of heart disease and high blood level of cholesterol.

Psychologists can play a pivotal role in motivating individuals with those modifiable risk factors to address them by helping these individuals to recognize their stressors and stress symptoms and educating them on evidence-based stress management approaches such as cognitive-behavioral strategies, guided imagery and other relaxation skills.

For stroke patients, with the extreme shock and fear associated with the suddenness of the illness; the huge sense of uncertainty brought about by impairment of body functions; experiences of loss and grief, psychological problems such as depression, anxiety, frustration and anger are common post-stroke disabilities. Direct psychological intervention can help alleviate some of these mental and emotional psychologists can also contribute to the care team by delivering training in psychological care and counseling skills and serving as a source of advice and support to the staff so that they could better meet the emotional needs of the distressed patients in their regular and extended contact with the latter.

Secondary Stroke Prevention

SS-03

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Stroke is the third leading cause of death in HK and results in significant morbidity and disability among the survivors. About 70% of stroke is ischemic in nature, mostly due to atherothrombotic occlusion and cardiogenic embolism. According to the latest report from Oxford Vascular Study, patients with prior TIA or minor stroke run a recurrent stroke risk of 18% in the subsequent 3 months, implying that secondary stroke prevention should be implemented as soon as possible.

Elucidation of the stroke aetiology and mechanism dictates the preventive strategy. Promising data from stroke prevention trials has equipped us with a wide range of armamentarium to tackle this potential fatal disorder. The preventive strategies for ischemic stroke can be divided into the following categories:

(1) Modification of risk factors and improving the cardiovascular risk profile

(a) Lifestyle modification e.g. weight reduction, regular exercise, lowering stress level, abstinence from smoking and heavy alcohol consumption
(b) Control of hypertension and target BP < 140/90 mm Hg
(c) Control of diabetes mellitus and target HbA1C < 7%
(d) Statins for normal or hypercholesteronemia and target LDL < 2.6 mmol/L
(e) Correct endothelial dysfunction with ACEI / ATII blockers
(f) Possibly lowering homocysteine level if elevated

(2) Antithrombotics: Antiplatelets vs Anticoagulants vs Combination

(a) Aspirin confers a 20% ischemic stroke risk reduction and it should be given within 48 hours after an ischemic event.
(b) Clopidogrel offers 10% more risk reduction compared to Asprin alone. It is indicated for those with Aspirin failure or intolerance, and in higher risk patients.
(c) Dipyridamole + Aspirin: the relative risk reduction (RRR) of this combination doubles the effect of Aspirin or Persantin alone (37% vs 18% and 16% respectively) according to the ESPS II study. The ongoing ESPRIT is a confirmatory trial.
(d) Emerging data to support the use of combination of antiplatelet agents especially in high risk populations. The MATCH trial is going to clarify the efficacy of stroke prevention using this combination strategy.
(e) Warfarin is indicated in cardiogenic embolism. An INR of 2.0-3.0 in patients with chronic atrial fibrillation confers a 68% RRR in recurrent stroke compared to placebo and the RRR for aspirin is about 22%. Other potential indications include aortic arch atheroma, arterial dissection, large PFO and cerebral venous thrombosis. It is however under-utilized especially in the elderly population

(3) Surgical revascularization

(a) Carotid endarterectomy (CEA) vs Carotid angioplasty and stenting (CAS): CEA is effective in symptomatic patients with > 70% carotid stenosis provided that the procedural stroke/death rate is < 6%. However, only a minority will benefit from surgery as extracranial disease is relatively rare among Chinese. CAS appears to be a promising alternative following the use of clopidogrel and distal protection device. Current trials are underway to compare the results of CEA and CAS.
(b) Intracranial angioplasty +/- stenting: This becomes technically feasible with advances in catheter design but the peri-procedural complication rate can be high (~ 17%). It should be reserved in stroke centers specialized in vascular intervention.
(c) Extracranial-intracranial bypass surgery: This was generally abandoned following a large randomized trial report in 1985. Clinical trials are now looking into its efficacy in symptomatic patients selected with hemodynamic criteria.

In conclusion, stroke is now becoming a much more preventable disease. A significant drop in the incidence of stroke in the future should not be far away. Expedite diagnosis and early implementation of preventive measures would help to translate the observed benefit from trials to clinical practice.

Acute Stroke Care in Hong Kong

SS-04

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Stroke is the third leading cause of death and the major cause of disability in Hong Kong. Based on information from death certificates, the annual stroke mortality is 3,000–3,500 of rate 45–52 per 100,000 in recent few years.

In Hong Kong, more than 90% of hospital services are provided by the Hospital Authority (HA) which is wholly funded by the Government. All Hong Kong residents are entitled to enjoy comprehensive medical services heavily subsidized by the Government. Under HA, there are 14 acute general hospitals distributed in 7 clusters providing acute stroke care. It is the policy to admit all acute stroke patients for hospital treatment. There are about 25,000 hospitalizations for acute stroke each year. All acute stroke patients are admitted to the Medical Department. They would be transferred to Neurosurgery Department only if neurosurgical intervention is contemplated. The usual management of acute stroke patients in major regional hospitals are: acute stroke unit care with multidisciplinary approach and general medical care; non-contrast CT scan of the brain within 24 hours; early initiation of appropriate anti-thrombotic therapy; identification and treatment of risk factors; and early initiation of rehabilitation.

After stabilization, if further rehabilitation is required, stroke patients will be transferred to rehabilitation hospital in the same cluster for inpatient rehabilitation or discharged home with outpatient rehabilitation at day hospital according to the neurological impairment and social support.

Predictive Factors for Ischemic Strokes Complicating Tuberculous Meningitis

PP-01

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Background

Tuberculous meningitis (TBM) is a serious neurological disorder which is not uncommon locally. Ischemic strokes complicating TBM cause severe morbidity and even mortality. Predictive factors for symptomatic cerebral infarcts complicating TBM are uncertain.

Methods

Patients with TBM managed in our hospital from 1997 to 2001 were studied. All had initial CT brain before lumbar puncture and repeated CT/MRI brain scan at 3 months of treatments. An eight-week course of systemic corticosteroids were given for patients with stages 2 and 3 disease plus anti-TB medications for 12-18 months, with clinical assessments at 1 month, 3 month and then every 4 months by neurologists. Death and a modified Barthel index <12 at 1 year of therapy were criteria for poor prognosis. Patients with and without complicated ischemic strokes were compared.

Results

A total 31 patients were studied, 7 developed ischemic stroke early or late in the course of disease. The mean age of onset for patients with and without ischemic strokes were 45.3 and 43.1 years ($p=0.432$). Two patients developed asymptomatic cerebral infarcts on MRI scan at 3 months. TBM complicated by ischemic strokes were characterized by a longer duration of presenting symptoms, mean 22.9 days versus 6.5 days for those without ischemic strokes ($p=0.015$), higher frequency of stage 2 or 3 disease on presentation ($p=0.043$), history of incoordination ($p=0.02$), cerebellar ataxia on examination ($p=0.001$), hydrocephalus on initial CT scan ($p=0.018$), residual hemiparesis ($p<0.001$) and poor prognosis at 1 year ($p=0.001$).

Conclusion

Ischemic stroke complicating TBM is not uncommon (23%). Ataxia on presentation and hydrocephalus on initial CT brain may predict.

Influence of Emergency Room Fee on Acute Stroke Presentation

PP-02

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Objective
With the recent introduction of emergency room fees at public hospitals patients seeking medical care are required to pay a basic charge. We hypothesize that this consultation fee would discourage patients from seeking prompt medical advice. This observational study sought to evaluate timing of patient presentation with acute stroke in an urban public hospital, and to evaluate whether there is difference in presentation delay before and after the introduction of emergency consultation fee system.

Method
All consecutive patients presenting with acute stroke and admitted to the medical wards of our hospital over two specified two-month periods before and after the new fee system were enrolled. Cases were ascertained from the computerized admission and discharge records of the emergency and the medical department. We recorded the onset of neurological symptoms prior to presentation to the emergency department and the interval, in hours, between the onset of stroke and arrival time at the emergency department. We tested for associations between presentation interval before and after the new system. Multiple linear logistic regression models were constructed to further evaluate potential prediction factors of presentation delay among stroke patients, at a significance level of 0.20, for variable entry into the model.

Results
A total of 173 subjects were recruited before, and 189 after, the introduction of consultation fee system. The median time for presentation was 9.7 hours and 8.4 hours respectively (p=0.66). Acute ischemic stroke accounted for 91% of the stroke diagnosis, mean age of patients was 71 years. Unconsciousness upon arrival at emergency department was more likely to be associated with a presentation interval of less than 5 hours (odds ratio 0.18, CI 95% 0.08-0.42, p <0.0001). When patient age was analyzed as continuous variable, it was significantly associated with presentation delay, in hours (r = -0.14, p=0.08). A higher proportion of stoke patients admitted after the consultation fee system, on the other hand, were unconscious upon arrival (12% versus 6%, p=0.04).

Conclusion
The shortest reported intervals between stroke onset and presentation to emergency department are from countries with free access to medical care. We did not demonstrate a delay in acute stroke presentation with the emergency room fee system. However physicians should continue to explore strategies for reducing late presentation of acute stroke.

Dysphagia in Patients with Cerebrovascular Disorders – Incidence and Outcome

PP-03

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Objective
Some of patients with cerebrovascular disorders (CVD) suffer from dysphagia, which is the most significant risk factor for the development of pneumonia and could also delay the patient's functional recovery. This study was conducted to delineate the incidence and outcome of dysphagia patients who were referred for rehabilitation because of CVD.

Design
We retrospectively reviewed the medical records of forty-six patients who were admitted because of dysphagia in patients with CVD. There were 31 men and 15 women, with a mean age of 60±15 years consisting of 20 cerebral hemorrhage, 20 cerebral infarction, 3 head injury and 3 subarachnoid. Information on the patients' clinical features, feeding status and the results of videofluoroscopic swallowing examinations were obtained through chart review.

Results
(1) A total of 89% of the dysphagic individuals depended on tube feeding at the initial evaluation; 46% of all individuals could not resume oral intake after swallowing rehabilitation at discharge. (2) The incidence of aspiration pneumoniae was 12%. There was a correlation between the detection of aspiration by modified barium meal videofluoroscopy and the development of aspiration pneumoniae. (3) Statistical analyses revealed a significant association between poor feeding status and outcome.

Conclusions
The recovery of dysphagia was relatively 50% in our study population. Feeding status at discharge would be associated to be one of important factors to determine the outcome of dysphagia in patients with CVD.

Seasonal Variation in Stroke: Results from the PYNEH Stroke Registry

PP-04

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Background and Objective
Seasonal variation has been linked to stroke occurrence and mortality, with an incidence peak during the colder period of the year. However, the association has been inconsistent and still remained in controversy. The aim of this retrospective study is to determine whether there is any seasonal variation in acute stroke characteristic in Hong Kong.

Method
We analyzed the year 2003 data in Pamela Youde Nethersole Eastern Hospital (PYNEH) Stroke Registry. We compared the stroke occurrence, proportion of ischaemic and haemorrhagic stroke, and stroke mortality rate between summer (June to August) and winter (December to February).

Results
In year 2003, there were 887 acute stroke admissions (excluding subarachnoid haemorrhage) to our hospital: 725 ischaemic stroke (IS) and 162 haemorrhagic stroke (ICH); 462 male; mean age of 73 (range from 33 to 101). The overall hospital fatality rate was 10.5%, with IS fatality rate of 6.3%, ICH fatality rate of 29.0%.

On comparing the figures in summer versus winter: the number of stroke was 184 vs 236; the IS/ICH ratio was 5.1 vs 3.9; the overall mortality rate was 9.0% vs 14.3%; the mortality of ICH was 26.7% vs 39.6%. All the differences were not statistically significant.

Conclusion
In winter, there is about 20% more acute stroke in Hong Kong and a trend of greater proportion of ICH and higher mortality, but it does not reach statistic significance. A longer or a territory wide study is needed to clarify the possible role of cold temperature in the development of stroke, especially haemorrhagic stroke and its effect on fatality.

Cognitive Impairment and Functional Outcome after Small Subcortical Infarct

PP-05

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Objectives
Although acute small subcortical infarct (SSI) can induce both motor and cognitive impairment, the latter has received less attention. We aimed to assess the prevalence of the varying severity of cognitive impairment and its association to functional outcome after acute SSI.

Methods
Consecutive patients admitted to hospital because of acute SSI were assessed at 3 months after stroke. We performed a semi-structured clinical interview to detect development or deterioration of cognitive symptoms after SSI. Severity of cognitive symptoms was graded according to the clinical dementia rating scale (CDR) into severe (CDR≥1), mild (CDR=0.5), and CDR=0. Performance on psychometric tests (mini-mental test, Alzheimer's Disease Assessment Scale – cognition, Mattis Dementia Rating Scale – Initiation / Perseveration subscale) was compared among the 3 groups with reference to 41 healthy controls. Clinical features (basic demographic data, vascular risk factors), stroke severity (National Institute of Health Stroke Scale), functional outcome (Barthel Index, instrumental activities of daily living), and neuroimaging features (site of SSI, number of silent SSI, white matter changes) were also compared among the 3 groups. Multivariate regression analysis was performed to find predictors of poor functional outcome.

Results
Among the 64 included patients, eight (12.5%) had severe and 24 (37.5%) had mild cognitive impairment. Patients with severe cognitive impairment had the worse performance on cognitive tests, white matter changes, and functional outcome despite having mild and similar stroke severity compared to patients of other groups. Patients with mild cognitive impairment had similar clinical features, stroke severity, performance on psychometric tests, functional outcome, and neuroimaging features to patients with CDR=0. Poor performance on psychometric tests, rather than stroke severity, had the strongest association to poor functional outcome.

Conclusions
Acute SSI induced mild to severe cognitive impairment in half of the patients. Performance on cognitive tests had the strongest association to functional outcome after SSI.

PP-06

Relationships between Daily Physical Activity and Exercise Endurance in Patients with Cerebrovascular Disorders

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Objective
The purpose of this study was to investigate the relationships between the daily physical activity with pedometric measurement at home and the oxygen uptake (VO2) kinetics on exercise endurance in patients with cerebrovascular disorders (CVD).

Design
Eighteen CVD patients (14 male and 4 female; 61±7 years old) living in the community participated in this study. 10 patients were depended on walking using T–cane and /or ankle-foot orthosis (Walking Group) and 8 were depended on wheel-chair (W/C Group). The daily physical activity was assessed to measure the daily gait steps using pedometric calorie counter (Life Corder; Suzuken Ltd., Japan) for 12±2 days. The exercise endurance was assessed to examine the VO2 kinetics with a graded bicycle exercise test, monitoring gas exchange.

Results
(1) The average of walking steps, exercise energy expenditure in W/C Group were significantly lower than those in Walking Group ($p<0.01$). (2) The oxygen deficit and time constant (τ on) in W/C Group were significantly higher than those in Walking Group ($p<0.01$). Although the maximum VO2 and work load in W/C Group were significantly lower than those in Walking Group ($p<0.01$). (3) There were negative correlation between the walking steps and the oxygen deficit ($r= -0.58$), although positive between the walking steps and the maximum VO2 ($r=0.57$).

Conclusions
These results would be suggested that the gait performance of daily physical activity at home be generally related with exercise endurance in patients with CVD.

Blood Pressure Level, CT Blood Volume and Prognosis in Intracerebral Hemorrhage

PP-07

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Introduction

Intracerebral hemorrhage (ICH) is an important cause of stroke and mortality in this locality. The aim of this study is to document and correlate the early blood pressure profile after the onset of event with neurological deterioration, growth of the hematoma and the clinical outcome.

Methods

We performed a prospective observational study of consecutive patients with spontaneous ICH admitted to our hospital. Patients had neurological evaluation and CT scan performed at baseline, and repeated within 24-48 hours. A detailed blood pressure profile was recorded for the first five to seven days after onset.

Results

Of the 81 patients who presented with ICH in the one-year study period, three were excluded because of brain trauma, tumour or aneurysm. Forty-eight (61.5%) had pre-existing hypertension but only 33 (68.8%) had been treated before the index stroke. Prognostic factors for death at 28 days included a low Glasgow Coma Scale of <8/15 on admission, hematoma volume of ≥40 mm^3 on the first CT, presence of intraventricular blood and a highest mean arterial pressure (MAP) of ≥130 mm Hg in the first few days (cut-off point for treatment as recommended by the American Heart Association). Overall the outcome for ICH in this group of 78 patients was poor with 27 (34.6%) deaths, 13 discharged to nursing homes (16.7%) and 13 (16.7%) still remaining in hospital at 28 days.

In patients with their highest MAP ≥130 mm Hg, occurrence of early neurological deterioration as measured by GCS and 28 day mortality were significantly increased (OR=3.81, 95% CI=1.01-14.43 and OR=3.90, 95% CI=1.16-13.10 respectively).

Significant growth (more than 33%) in the volume of hematoma occurred in 14 (33.3%) out of 42 patients who had a second CT scan. A highest MAP ≥130 mm Hg was associated with hematoma growth (OR=6.92, 95% CI=1.30-36.82). Growth of hematoma was not significantly related to sex, age, fibrinogen level, previously diagnosed hypertension, prior use of alcohol or aspirin, smoking or diabetes.

Conclusion

Hypertension is the most important cause of ICH but the treatment rate remained low in our local population. Patients with ICH have a poor prognosis in general. Low GCS on admission, large hematoma volume, intraventricular blood extension and a high blood pressure are poor prognostic factors. Further studies are necessary to elucidate the complex relationship between the blood pressure, hematoma expansion, neurological deterioration and prognosis.

PP-08

The Application of Deep Pharyngeal Neuromuscular Stimulation as Treatment for Severe Pharyngeal Dysphagia Resulting from Brainstem Stroke – a Preliminary Review

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Background
Lesions in the lower brainstem often result in significant oropharyngeal impairment. Typically, these patients exhibit near normal oral stage but significantly impaired neuromuscular control and triggering of pharyngeal swallow, prolonged non-oral feeding are warranted for airway protection and prevention of aspiration pneumonia.

Deep pharyngeal neuromuscular stimulation (DPNS) is a new therapeutic program that restores pharyngeal muscles strength and reflexes by stimulating "directly" the pharyngeal musculature for improving efficiency of swallowing function.

Case Series
Patients referred to speech therapy service with diagnosis of brainstem stroke and severe dysphagia who were also suitable for DPNS training were included for this case series report, during the period July 2002 to June 2003. There were 3 male subjects fulfilled these inclusion criteria. They all required non-oral feeding initially. Their mean age was 70 (63 – 77) and average day of commencing DPNS treatment was 17 (4 – 40) from onset. Outcome measurement including Video-fluoroscopic swallowing study (VFSS) and Royal Brisbane Hospital Outcome Measurement for Swallowing (RBHOMS) were employed.

Pre-DPNS VFSS showed silent penetration or aspiration across all consistencies for all patients. In post-DPNS VFSS, aspiration was eliminated or occurred in only one consistency. For RBHOMS, scores of pre-DPNS was 2 and 3 (i.e. nil by mouth, with some difficulties in managing secretions), while score of post-DPNS was 7 and 9 (i.e. upgrading with modified diet; swallowing function at pre-morbid level). Average time from non-oral feeding to full oral feeding was 4.2 (2.5 – 5) weeks.

Conclusion
These preliminary findings show that DPNS is an efficient and effective way of treating patients with severe pharyngeal dysphagia resulted from acute brainstem stroke, however, further large scale control study is needed to validate the findings.

The Impact of Computed Tomography Angiography on the Management of Ruptured Intracranial Aneurysms

PP-09

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Aim
To assess the clinical value of computed tomographic angiography (CTA) as the primary diagnostic modality in aneurismal subarachnoid haemorrhage (SAH) and its subsequent influence on management.

Patients and Methods
All patients who presented with acute SAH would have a CTA as the initial investigation. Based on the findings, catheter angiogragraphy (DSA) was performed with either endovascular obliteration with Guglielmi detachable coils (GDC) at the same setting or microsurgical clipping of the aneurysm soon after.

Results
From January 95 to May 97, 124 patients were admitted to the neurosurgical unit with acute spontaneous SAH, all of them received CTA examination. 94 aneurysms in 79 patients were identified by CTA. DSA was obtained in 110 patients, demonstrating 110 aneurysms in 91 patients. CTA and DSA findings were correlated in 89 aneurysms. The sensitivity and specificity of CTA for all aneurysms was 80.9% and 73.7% respectively. 45 patients (49.5%) in total underwent endovascular treatment, of which 88.9% achieved satisfactory aneurysm obliteration. 34 patients (75.6%) proceeded to direct endovascular treatment of the aneurysm based on CTA appearances, in whom complete obliteration was achieved in 29 (85.3%). In 38 patients (47.3%) surgery was considered more appropriate. 8 patients were not suitable for any intervention. 75% of all patients had favourable outcome while 25% had unfavourable outcome. To compare with the period of 1993-94 when primary treatment was surgery alone and when the favourable outcome was 71% and unfavourable outcome was 29%, the difference is not statistically significant.

Conclusion
The selection of patients for endovascular or surgical treatment of aneurysms can be reasonably predicted by CTA appearances. In selected cases, a more favourable outcome can be achieved with endovascular treatment. In a neurosurgical unit which provides complementary endovascular and surgical options of treatment, CTA helps to streamline the management algorithm and economically utilize DSA resources.

Changes of ADL Using Functional Independence Measure (FIM) Instrument in Patients with Cerebrovascular Disorders

PP-10

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Objective
The purpose of this study was to investigate the changes of activity of daily life (ADL) using functional independence measure (FIM) instrument in patients with cerebrovascular disorders (CVD).

Design
One hundred CVD patients (73 male and 27 female; 60±11 years old) who were admitted in Hyogo Rehabilitation Center (HRC) participated in this study. The variables such as FIM total scores on admission and discharge, the stroke type, the onset to admission interval, the length of rehabilitation hospital stay, and the outcome were drawn out from HRC Stroke Database. Statistical analysis was used by paired Student's t-test. Statistical probability <0.05 was considered significant.

Results
(1) The average of the onset to admission interval and the length of rehabilitation hospital stay were 56±33 and 91±24 days. FIM score on discharge was significantly higher than that on admission (75±33 vs 60±29; $p<0.001$). (2) The changes of FIM (ΔFIM) score on admission and discharge in right side hemiplegia was significantly higher than that in left side hemiplegia (23±16 vs 14±14; $p<0.05$). (3) ΔFIM in patients with going home was significantly higher than that in patients with going to nursing home (87±27 vs 38±18; $p<0.001$).

Conclusions
These results would be suggested that FIM instrument is effective in stroke rehabilitation assessment as a means of categorizing a patient's condition, and as data for program evaluation.

Stroke Unit Outcomes in a Local Hospital

PP-11

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Objectives
To review the basic demographics and treatment outcomes of stroke patients in a local hospital, and to compare patients treated in stroke unit with those cared in general medical beds.

Methodology
Study was conducted in a regional hospital from 1st July 2002 to 31st January 2003 after the commencement of Stroke Unit service. The Stroke Unit is geographically fixed with 10 beds (5 for each sex) and admits patients directly from Emergency Department irrespective of age of the patients and type or severity of stroke. It provides protocol-driven care and is managed primarily by a neurologist. For logistic reasons, many stroke patients were not admitted to the Stroke Unit and cared in general medical beds. Data were prospectively collected on all patients with stroke being the main admission reason. Basic demographics, types of strokes, discharge status and length of stay were analyzed. Chi-square test was used to compare categorical variables and t test was used to compare continuous variables.

Results
Three hundred and ten (149 into stroke beds and 161 into general beds) confirmed stroke patients were admitted over the studied 7 months' period. Mean age was 70.4 year-old with male to female ratio of 1.2:1. Eighty percent of strokes were ischaemic while haemorrhagic, TIA and SAH accounted for 12%, 7% and 1% respectively. Lacunar syndromes constituted 60% and the rest were divided equally between total anterior, partial anterior and posterior circulation syndromes. The mean length of stay in stroke beds was 8.9 days and that in general beds was 5.9 days ($p<0.001$). Among the stroke beds patients, 42% were discharged directly to home and 3% died. The corresponding figures in general beds patients were 29% and 8% ($p=0.022$ and 0.037 respectively).

Conclusions
The stroke patients profile reflects local prevalence, with majority of them having ischaemic strokes and lacunar syndromes. In terms of outcome, stroke beds patients stayed longer but were more likely discharged home directly and had fewer deaths. Reason for this could not be analyzed from the data collected but presumably was due to the protocol-driven management and fewer complications occurring in stroke beds patients. This concurs with the proven benefit of Acute Stroke Unit care.

The Changes of WBC in Patients with Acute Cerebral Infarction and the Effect on Progress of the Disease

PP-12

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Objective
To investigate the changes of white blood cell (WBC) in acute cerebral infarction and the effect of the changes on prognosis of the disease.

Methods
The changes of WBC in 82 patients with acute cerebral infarction were measured.The correlation between the changes of WBC and the evaluation of neuronal functions damage, and the area of cerebral infarction were explored.

Results
The WBC increased more greatly and the evaluation of the neuronal functions damage was much higher in patients with large infarction than those with small infarction. Patients with high WBC recovered more slowly.

Conclusions
The increase of WBC play an important role in prognosis and progress of the disease.

Hong Kong Childhood Stroke Registry – a Study of 50 Cases (1991-2002)

PP-13

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Background

The incidence of pediatric stroke is 2.7 per 100,000 children per year in Western countries. There is no data in Asian children. A Hong Kong Childhood Stroke Registry was established to study the pattern, etiology and prognosis of pediatric stroke in Chinese children in Hong Kong.

Materials and Methods

Stroke is defined as a focal neurological deficit of sudden onset, resulting from irreversible focal ischaemic or hemorrhagic damage to the brain parenchyma secondary to a cerebrovascular disorder. A prospective childhood stroke database was collected during a 12-year period (1991-2002) for children with stroke assessed in the University of Hong Kong affiliated hospitals (Queen Mary Hospital & Duchess of Kent Children's Hospital). Neonatal strokes were excluded. The clinical presentation, etiologies and outcomes were studied.

Results

Altogether the Registry included 50 children (boys:girls = 28:22). The mean age was 5.4 years. The most common presenting clinical features were seizures and hemiplegia. The type of stroke consisted of ischaemia (36) and haemorrhagic type (14). Despite extensive workup for possible underlying causes, 12% were idiopathic (thrombotic (3) & hemorrhagic (3)). For thrombotic stroke (N=18), 11 were vascular origin [moya-moya disease (3), neurofibromatosis (2), fibromuscular dysplasia (1) and post-infectious vasculitis (7)]; 5 were haematological origin [leukaemia (3); thalassaemia (2); and 1 each with severe dehydration and Mitochondrial Encephalopathy Lactic Acidosis Syndrome (MELAS)]. Of those with embolic stroke (N=15), all had underlying congenital heart diseases. For 14 cases with haemorrhagic stroke, 2 had arteriovenous malformation, 7 had bleeding tendency [leukaemia (2), aplastic anaemia (2), hemophilia (2) and Wiskott Aldrich Syndrome (1)] and 2 had more than one risk factors (leukaemia and *E. coli* sepsis; congenital heart disease with streptokinase infusion after cardiac catheterisation). None had sinovenous thrombosis.

Outcome

The mortality rate is 18% (N=9) and 44% had neurological deficit, including mental retardation (11), epilepsy (9) and hemiplegia (14). Five cases had recurrent episodes of stroke.

Summary

Our local stroke registry was different from the Caucasians. The majority had thrombo-embolic stroke due to underlying congenital heart disease. As for hemorrhagic stroke, the majority were due to bleeding tendency. The possible explanation is the high referral rate of pediatric cardiology and haematology/oncology cases in our center. The majority of those who survived had neurological sequelae.

Enhanced Endogenous Tissue Type Plasminogen Activator (tPA) in Both In Vivo and In Vitro Models of Ischemic Injury

PP-14

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We reported that tissue plasminogen activator (tPA) from activated microglia triggers apoptosis of hippocampal neurons in culture (Flavin et al. Glia 29: 347,2000). Studies of focal ischemia in tPA knockout mice (Wang et al. Nature Medicine 4: 228, 1998), together with in vitro studies (Nicole et al. Nature Medicine 7: 59-64, 2001) suggest that tPA may facilitate glutamate receptor-mediated neurotoxicity. However clinical trials of tPA administration in stroke showed significant benefit in outcome, particularly when tPA was given within 3 hours. Variation in endogenous tPA production over time may explain this apparent contradiction. We examined changes in brain tPA expression after transient middle cerebral artery occlusion (MCAO) and in neuronal cell cultures after oxygen-glucose deprivation (OGD). Adult rats were subjected to MCAO for 90 minutes. This resulted in ipsilateral damage to striatum and cortex. Brainsections collected at 3, 6, and 24 h were submitted to immunohistochemistry and immunoblotting for tPA. Strong expression of tPA antigen was noted in the lesion side 3 h after MCAO and remained strong at 6 and 24 h. Increased tPA was seen in the non-lesion side only at 24 h. tPA was not detected in controls. For cell culture experiments tissue was harvested from E18-19 rat embryos and exposed to OGD at DIV 9-10. Abundant tPA was detected in bathing medium of both pure hippocampal neuronal and mixed hippocampal and cortical cultures 24 h after OGD. Increases in endogenous tPA may impact on fate of neurons exposed to exogenous tPA after ischemia.

Relationship between Plasma HCY, Polymorphisms in MTHFR and CBS, and Cerebral Thrombosis

PP-15

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Objectives
Stroke is a major cause of mortality and morbidity in the world. Hypertension, hyperlipidemia, diabetes mellitus, cigarette smoking and obesity are accepted risk factors for these diseases. Recently, the homocysteine (Hcy) theory of atherosclerosis (AS) is established. Hcy is metabolized by the enzyme 5,10-methylenetetrahydrofolate reductase (MTHFR) and the enzyme cystathionine-ß-synthase (CBS). We take this study to explore the relationship between plasma Hcy level, polymorphisms in MTHFR and CBS, and the incidence of cerebral thrombosis.

Methodology
87 patients with acute cerebral thrombosis were age and gender matched to 80 controls with no evidence of any vascular events. Plasma levels of Hcy were measured by high-performance liquid chromatography–fluorescence detection (HPLC–FD) technology. The presence of the C677T MTHFR mutation was determined by a polymerase chain reaction (PCR) assay and subsequent restriction enzyme digestion, and those in CBS was determined by amplification refractory mutation system (ARMS).

Results
Fast plasma Hcy levels were higher in the patient group (15.28±4.33 umol/L) compared with those in the control group (11.32±3.86 umol/L) ($t=6.28$, $p<0.001$). Different genotype had different influence on plasma Hcy levels. Individuals homozygous for the MTHFR, CBS G919A, and CBS T833C mutations had significantly higher plasma Hcy level than the wild type, while individuals heterozygous might not. There was no difference in genotype frequency or allele frequency between case group or control group.

Conclusions
Common mutations in MTHFR and CBS had been associated with increased plasma Hcy levels but not increased risk for acute cerebralthrombosis. Hyperhonocysteinemia is an independent risk factor for cerebral thrombosis.

Association of Insulin Sensitivity and Plasma Leptin Level with Ischemic Stroke

PP-16

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Objective
To investigate the association of insulin-sensitivity and plasma leptin level with cerebral infarction.

Methods
The plasma leptin, by means of ELISA, insulin, by means of radioimmunoassay, glucose, lipids levels and body-mass index (BMI) of 31 patients with atherothrombotic cerebral infarction (ACI), 30 patients with lacunar infarction (LI) and 21 healthy controls were determined in this study.

Results
Compared with those in the controls (3.49±1.85 μIU/ml and -2.75±0.54), there were an elevation of plasma insulin level (6.17±4.33 μIU/ml) (χ^2=6.060, *P*=0.014) and a reduction of insulin-sensitivity index (ISI) (-3.22±0.79) (*t*=3.124, *P*=0.03) in the ACI patients. The plasma leptin level was correlated negatively to ISI (*r*=-0.633 in male and -0.503 in female, both *P*<0.01) in the stroke patients.

Conclusions
Insulin resistance is a risk factor for ACI, and increased plasma leptin level plays an important role of pathogenesis of insulin resistance.

Stroke is a Failure of Addressing Cardiovascular Risk

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Stroke (cerebrovascular disease) is a leading cause of death and disability worldwide. Out of the 16.6 million deaths due to cardiovascular disease 5.5 million are due to stroke.[1] About three fourths of these deaths are from low and middle income countries with China alone contributing to nearly 1.5 million deaths. From a global perspective the stroke situation is changing rapidly. While there are favourable trends in stroke mortality in Western Europe, North America, Australasia and Japan, it is becoming an increasingly important health problem in developing countries due to ageing and unhealthy consumption patterns linked to globalization and urbanisation.[2]

Need for prevention

Stroke has a high case fatality and a major impact on quality of life. The International Stroke Trial found 79% and 63% dead or dependant at 6 months with and without atrial fibrillation.[3] Even in settings with very high technology facilities 56% of non haemorrhagic stroke patients and 74% of haemorrhagic stroke patients are dead or dependant at six months.[4]

Acute stroke care and rehabilitation is costly and is not affordable to countries with severely constrained health budgets. For them the more feasible and sustainable solution to stroke is prevention. Evidence based cost effective interventions are available for prevention of both first ever strokes and recurrent attacks.[5,6]

Prevention of first ever strokes and recurrences

A substantial proportion of the world population is currently is at high risk of developing strokes and heart attacks[1] due to tobacco use (1.3 billion), overweight (1 billion), elevated blood pressure, elevated blood cholesterol and diabetes (1 billion). These cardiovascular risk factors often cluster together. Majority of strokes occur in individuals with modest elevations of several of the above risk factors. A substantial proportion of strokes can be prevented through the implementation of population-wide strategies and integrated approaches to cardiovascular risk reduction in high risk individuals.[6]

Patients with established CeVD are at considerably increased risk of having recurrent vascular disease and modification of unhealthy life styles, pharmacological interventions and revascularization procedures appreciably reduce the high risks of recurrent vascular events. The evidence supporting the use of pharmacological interventions in secondary prevention is, inevitably, particularly compelling and readily transferable between populations and cultures.

In introducing initiatives to increase uptake of primary and secondary prevention of stroke it is important to avoid disparities by ensuring that the availability and affordability of treatment for lower income groups and for older people is taken into account. The challenge is to workout the affordable mix of these synergistic strategies for prevention and management of stroke.

WHO activities

World Health Organization (WHO) has recently stepped up its activities for the prevention and control of cardiovascular disease including stroke. The global strategy for prevention and control of noncommunicable diseases (NCD) was endorsed by the 52nd World Health Assembly in 2000. The main risk factors for NCD are been targeted through global action, including such initiatives as the Framework Convention on Tobacco Control and the development of global strategy on diet and physical activity. National surveillance systems for key risk factors have been strengthened through the WHO Stepwise approach. Projects have been initiated in many low and middle income countries to scale-up secondary prevention of CVD and Integrated approach to cost effective reduction of cardiovascular risk.

References

1. World Health Organization. The world health report 2002. Reducing risks, promoting healthy life. 2002. Geneva, WHO.
2. Sarti C, Rastenyte D, Cepaitis Z, Tuomilehto J. International trends in mortality from stroke, 1968 to 1994. Stroke. 2000; 31:1588–1601.
3. 3.The International Stroke Trial (IST): a randomised trial of aspirin, subcutaneous heparin, both, or neither among 19435 patients with acute ischaemic stroke. International Stroke Trial Collaborative. Lancet. 1997 May 31;349(9065):1569-81.
4. Heller RF, Langhorne P, James E. Improving stroke outcome: the benefits of increasing availability of technology. Bull World Health Organ. 2000;78(11):1337-43.
5. Integrated management of cardiovascular risk. 2002.World Health Organization, Geneva.
6. Prevention of recurrent heart attacks and strokes in low and middle income populations: evidence-based recommendations for policy-makers and health professionals. 2003. World Health Organization Geneva (In press).

Therapeutic Strategy for Giant Intracranial Aneurysms

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Introduction

A giant aneurysm is defined as one larger than 2.5 cm in diameter, which is mostly with a wide neck and difficult to expose. So the surgical procedure is usually difficult.

Method

In our retrospective study, a consecutive series of 105 patients with giant intracranial aneurysms underwent surgical treatment from 1995 to 2003. There were 61 males and 44 females. The age of patients ranged from 11- 67 years old with mean of 42.5 years old. Our study demonstrated that giant intracranial aneurysms account for 8.5% of all intracranial aneurysms. The aneurysms located at ophthalmic artery in 45 cases, bifurcation of ICA in 26 cases, vertebral and basilar artery in 24 cases, Location Bifurcation of the ICA in 35 cases, intracavernous of the ICA in 14 cases, middle cerebral artery in 22 cases, anterior communicating artery in 11cases, posterior cerebral artery in 13 cases, vertebral artery in 8 cases, PICA in 2 cases. Aneurysms of different location or different shape, size were treated via different approaches and operative methods.

Method I: Direct clipping and dissection of aneurysm (35 cases)
First the proximal and distal parent artery, the aneurysmal neck and body should be exposed. Then the temporary clipping of the parent artery, proximal and distal to the aneurysms were performed. After that we punctured the aneurysmal sac, and resected the aneurysms and remove the thrombus. Lastly we clipped or sutured the wall of the aneurysms in order to reconstruct the parent artery.

Method II: Reconstruct parent artery with multiple clips (63 cases)
We performed temporary clipping of the parent artery for the exposure the neck of aneurysms, opened the aneurysm and remove the thrombus, then reconstructed the parent artery with windows clips to shape the parent artery and leave enough artery walls. Lastly the temporary clips were removed.

Method III: Ligation of ICA and isolation of aneurysms (7 cases)
First stage: We performed clipping of the ICA with Selverstone clip in neck. After the operation, we performed full clipping of the ICA gradually within one week. Angiography demonstrated that the ICA has been occluded and the blood supply has been established by contralateral ICA.
Second stage: We ligated the ICA and remove the Selverstone clip. Then we selected Pterional approach, exposed distal to the aneurysms and isolated it. After that we opened the aneurysms and removed the thrombus, decompressed the III, IV, VI cranial nerves.

Result

The angiography was performed 7 to 10 days after surgery. All aneurysms were occluded. A good patency of parent artery in 88 cases (83.8%). The mortality was 0.95%, the morbidity was 22.9%.
Excellent or good results were obtained in 71 out of 76patients (93.4%) according to an average of 25.5 months' follow-up (6-48 months).

Conclusion

Some points should be considered for the operations of the giant intracranial aneurysms, which include lumbar puncture in order to retract the brain, exposure of the segment of ICA in the neck before craniotomy if the aneurysms are located at the beginning of the ICA, and paying attention to that there is calcification in the wall of the aneurysms, and maintaining the diameter of the reconstructed parent artery large enough to ensure blood flow smoothly.

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