**Professor Raymond Cheung**

MBBS, PhD, FHKCP, FHKAM, LMCC, FAHA, FRCP, FRCPG, FRCP, FAAN, FESO

Lee Man-chiu Professor in Neuroscience, HKU
Clinical Professor, Div of Neurology, Dept of Medicine, HKU
Director, Acute Stroke Services, HK West Cluster Hospitals
Honorary Consultant, QANT, TWH & HKOS
Honorary Professor, Dept of Neurology, Sun Yat-Sen University, Guangzhou
Member, Board of Directors for the International Stroke Alliance
Immediate Past President, HK Neurological Society
Past President, HK Neurological Society
Council Member, HK Pain Society
Vice-Chairman, HK Brain Foundation

---

**Stroke Registry in Hong Kong**

15 May 2010
International Symposium on Stroke Registry
Chang Gung Healthcare System

---

**Hong Kong**

---

**Hong Kong - a Special Administrative Region of China**

9.6 millions square km

---

**Hong Kong Special Administrative Region**

1,095 square km

---

**Hong Kong Population**

- A Special Administrative Region of China
- End 2009: [figures of 1991 in brackets]
  - Resident population = 6.82 million
  - Median age = 40 (31) years
  - M:F = 8.86:10 (10.4:10)
  - 95% ethnic Chinese
  - More than primary school education: 74.5% (62)
  - Professionals/administrative: 33% (23)
  - Median monthly income: US$1,280 (660)
  - Median household income: $2,240 (1,270)
  - Mean household size: 3.0 (3.4)
  - About 70 neurology: 30 in private practice

Census & Statistics Dept, HKSAR
Stroke Registry

Hospital Stroke Registry

- Standardized & prospective collection of important information from stroke patients:
  - Number of stroke admissions
  - Types and subtypes of stroke
  - Age and gender
  - Stroke onset and delay in admission
  - Risk factors
  - Use of antithrombotics
  - Stroke severity
  - Laboratory results
  - Short-term outcome

Early Hospital Stroke Registry

Cerebrovascular Disease in Hong Kong Chinese

C.Y. Huang, MB, BS(HK), FRCP, F.L. Chan, DMED, FRCP, Y.L. Yu, MD(HK), FRCP(Edin), E. Wai, MB, BS(HK), MRCPI(Edin), and D. Chin, MB, BS(HK), FRACP

Our prospective study of cerebrovascular disease in Hong Kong confirms a previous clinical impression that stroke in the Chinese has a pattern different from that in Caucasians. We studied 540 patients (aged 20-70 years) with stroke. Compared monography or angiogram was obtained in 80.2% and showed an increase in the proportion with lacunar infarctions, which is consistent with the recently reported high incidence of lacunar infarction in Chinese. This increase in the incidence of central homogenous area not only in non-infarction and non-occlusion patients but also in elderly patients (66.9%) and those with a lacunar syndrome (12.8%). Our findings suggest that cerebrovascular disease in the Chinese ethnicity affects small vessels, causing lacunar and homogenous infarction. In future community studies on stroke prevalence, researchers should be cautious about interpreting similar prevalence rates as reflecting similar risk factors or pathologies. (Stroke 1990;21:256–259)

Huang et al, Stroke 1990

- 1 April 1984 to 31 March 1985
- 540 Chinese aged 20-70 admitted to Medical Unit of Queen Mary Hospital
- CT in 80.2% (within 3 d in 53.4%, 4-7 d in 18.7%, 2-3 wk in 23.3%, >3 wk in 4.6%)
- Autopsy in 5.9%

Huang et al, Stroke 1990

- Mean age 58.9 yr; M:F 1.3:1.0
- IS 50% (lacunar syndrome 43.3%)
- ICH 30.6%
- SAH 3.7%
- Others 15.7%
- IS: cortical 25.6%, subcortical 9.6%, lacunar 30%, posterior fossa 5.6%
- Pattern different from Caucasians

Early Hospital Stroke Registry


Stroke subtypes among Chinese living in Hong Kong: the Early Stroke Registry.


Department of Medicine, Chinese University of Hong Kong, Hong Kong.

The Early Stroke Registry is a prospective study of all patients admitted with stroke during a period in a general hospital in Hong Kong where the population is predominantly Chinese. Each patient was examined by a neurologist and 94% of the patients had a brain CT. Of 575 patients included in the study, 44.8% had a cortical-vascular infarction, 11.8% a subcortical-vascular infarction, 21.8% a lacunar syndrome, 1.7% an ICA or vertebrobasilar infarction, 6.2% a subarachnoid hemorrhage, and 1.5% an intracerebral hemorrhage. The overall 30-day case fatality rate was 57.6%. Comparison with five stroke registries from other sites suggests that intracerebral hemorrhage occurs less frequently and that there is no difference in the relative frequency for lacunar infarction. (Stroke 1990;21:256–259)
Shatin Stroke Registry; 1989
- 860 patients admitted to Medical Dept of Prince of Wales Hospital, including 31 TIA, 27 SAH, 12 tumor, 8 other diagnoses, 5 non-Chinese
- 777 (90.3%) Chinese with IS or ICH
- CT in 95.5%

Mean age 69.5 yr; M:F = 1:1
- IS 68.4%
- IS: 64.3% cortical/subcortical, 27% lacunar, 8.5% posterior
- ICH 27.1%
- ICH: 89.3% supratentorial, 10.7% infratentorial
- Uncertain 4.5%

30 d fatality rate 25.4% (20.5% cortical/subcortical IS, 2.1% lacunar IS, 22.2% posterior fossa, 42.6% supratentorial ICH, 56.5% infratentorial ICH)
- HT 44.5%, DM 15.3%, cardiac disease 11.6%, previous stroke 15.2%

IS 50-68%
- ICH 27-31%
- SAH 4%
- Cortical/subcortical IS 35-64%
- Lacunar IS 27-30%
- Posterior fossa IS 6-9%
- Supratentorial ICH 89%
- Infratentorial ICH 11%
- Risk factors 10-45%

Started in October 1996
- Common database for PYNEH & RH (two other regional hospitals on Hong Kong Island)
- Included data from PYNEH & RH from April 2004 to December 2005; plus a blood sample for DNA and serum
- Incorporated into hospital protocol since December 2008
Clinical study

Hong Kong patients’ knowledge of stroke does not influence time-to-hospital presentation

O.T.F. Cheung, M.N.S., F.R.C.P. (C), F.A.C.P.

Department of Neurology, Queen Mary Hospital, Hong Kong


text

Abstract

Circadian variation of stroke onset in Hong Kong Chinese: A hospital-based study

Raymond T.F. Cheung, Windsor Mak, K.H. Chan

Department of Neurology, University of Hong Kong, Queen Mary Hospital, Hong Kong


text

Circadian Variation of Stroke Onset in Hong Kong Chinese: A Hospital-Based Study

Raymond T.F. Cheung, Windsor Mak, K.H. Chan

Department of Neurology, University of Hong Kong, Queen Mary Hospital, Hong Kong


text

Table

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Classifiable onset (632 patients)</th>
<th>Unclassifiable onset (17 patients)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age, SD, yrs</td>
<td>68.4 ± 11.4</td>
<td>69.3 ± 8.5</td>
<td>0.7762</td>
</tr>
<tr>
<td>Males</td>
<td>465 (73.0%)</td>
<td>42 (78.8%)</td>
<td>0.4819</td>
</tr>
<tr>
<td>History of diabetes</td>
<td>396 (63.0%)</td>
<td>29 (55.6%)</td>
<td>0.7728</td>
</tr>
<tr>
<td>Hypertension</td>
<td>356 (56.0%)</td>
<td>25 (46.4%)</td>
<td>0.4802</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>235 (38.4%)</td>
<td>27 (51.6%)</td>
<td>0.1071</td>
</tr>
<tr>
<td>atrial fibrillation</td>
<td>137 (21.8%)</td>
<td>7 (12.9%)</td>
<td>0.1099</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>104 (16.5%)</td>
<td>10 (18.1%)</td>
<td>0.9062</td>
</tr>
<tr>
<td>Alcohol abuse</td>
<td>77 (12.2%)</td>
<td>6 (11.1%)</td>
<td>0.9383</td>
</tr>
<tr>
<td>Ischemic heart disease</td>
<td>151 (24.0%)</td>
<td>10 (18.1%)</td>
<td>0.4873</td>
</tr>
<tr>
<td>Paroxysmal atrial fibrillation</td>
<td>34 (5.4%)</td>
<td>3 (5.5%)</td>
<td>0.7360</td>
</tr>
<tr>
<td>NIHSS ≤ 5 admission &amp; SD</td>
<td>60 (9.5%)</td>
<td>7 (12.9%)</td>
<td>0.6085</td>
</tr>
<tr>
<td>TACS or PACT</td>
<td>24 (3.8%)</td>
<td>3 (5.5%)</td>
<td>0.7361</td>
</tr>
<tr>
<td>LACI</td>
<td>27 (4.3%)</td>
<td>3 (5.5%)</td>
<td>0.7361</td>
</tr>
<tr>
<td>DOC</td>
<td>71 (11.1%)</td>
<td>10 (18.1%)</td>
<td>0.0225</td>
</tr>
<tr>
<td>ICH</td>
<td>177 (22.3%)</td>
<td>17 (31.8%)</td>
<td>0.0200</td>
</tr>
<tr>
<td>SAB</td>
<td>264 (41.1%)</td>
<td>12 (22.4%)</td>
<td>0.0005</td>
</tr>
<tr>
<td>TIA</td>
<td>65 (10.3%)</td>
<td>2 (3.7%)</td>
<td>0.0775</td>
</tr>
</tbody>
</table>

Values in parentheses are percentages. NIHSS = National Institutes of Health Stroke Scale.

Comparing between the two groups using unpaired Student t-test or χ² test.

Sexual Functioning in Chinese Stroke Patients with Mild or No Disability

Raymond T.F. Cheung

Department of Neurology, University of Hong Kong, Queen Mary Hospital, Hong Kong


text

Abstract

This study was conducted to assess the effects of stroke on sexual function in patients with mild or no disability and to explore the association of clinical and psychosocial factors with post-stroke changes in sexual function. Consecutive stable Chinese patients were invited to complete a self-administered questionnaire covering their pre- and post-stroke sexual function and habits. Results from this cohort of 65 men and 63 women showed a post-stroke decrease in frequency, sexual arousal, orgasm and sexual satisfaction in 54.8%, 43.8%, 26.0% (mean) to 61.6% (mean), 28.0% (mean)/45.4% (mean) and 24.0% of patients, respectively. Logistic regression indicated smallness for sex and belief in performance effect of stroke on sexuality as psychosocial factors for observed sexual dissatisfaction. It is thus important to address these aspects in Chinese stroke patients with mild or no disability.

Copyright © 2010, Large AS, Base.
Use of the Original, Modified, or New Intracerebral Hemorrhage Score to Predict Mortality and Morbidity After Intracerebral Hemorrhage

Raymond Tai Fai Cheung, MBBS, MD; Lung-Tiu Zou, MBBS, MPHE

Background and Purpose: A simple clinical scale of intracerebral hemorrhage (ICH), comprising the Glasgow Coma Scale score, age, admission status, ICH volume, and intravenous thrombolysis was originally devised to predict 1-day mortality. We studied how well the original ICH score would predict morbidity and mortality and determined whether modifications would improve its predictability.

Methods: Patients admitted to a regional hospital with acute ICH in 1999 were reviewed. Independent predictors of mortality or good outcome (modified Rankin score <2) at 90 days were identified by logistic regression to devise a new ICH score for comparison with the original score. A modified score was created by adjusting National Institutes of Health Stroke Scale (NIHSS) for the Glasgow Coma Scale.

Results: The mortality rate was 28% and 35% had good outcome. Independent factors for mortality were high NIHSS score at admission, advanced age, severe intracerebral hematoma, and low admission temperature. To derisk ICH score, it predicts that a minimum score of 5 is associated with a 50% probability of good outcome, and a modified NIHSS score can improve the prediction significantly and good outcome. The original and modified ICH Scores predict mortality equally well. The improved modified ICH Scores were more predictive of good outcomes.

Conclusions: All ICH scores are simple clinical grading scales. Reliable predictions of good outcome and mortality, they are useful diagnostic markers and monitoring of clinical outcomes. (Stroke. 2005;36(5):1751-1756)

Key Words: cerebral hemorrhage; intracerebral hemorrhage; outcome; prognosis; stroke assessment

CASC at HKWC (QMH)

- Implemented on 16 December 2008
- Protocol-driven acute stroke care management during office hours
- Direct admission from AED
- Priority screening of acute stroke patients at AED
- Neurology medical staff informed by AED
- Urgent CT brain prior to admission
- Extended hours of screening for direct admission since 16 September 2009

CASC at HKWC from Mid Dec 2008 to Mid Dec 2009 (12 months)

- Dedicated CT scanner at AED: 3 September 2009
- Direct admission via AED: 104 acute stroke patients
- Expeditious transfer from general call wards: 5 acute stroke patients
- Total CASC admissions: 109
- 13 patients not admitted because all beds occupied (3), admission criteria not met (5) or outside admission time frame (5)

CASC at HKWC from Mid Dec 2008 to Mid Dec 2009 (12 months)

- Average LOS in CASC: 2.17 days
- Average LOS in neurology bed: 5.04 days
- Door to CT time: 45.9 min (10-204 min)
- CT to ward time: 27.2 min (6-97 min)
- IV rPA: 20 patients (18.34%)
- IMPACT 24: 7 patients (6.4%)
- DIAS 3: 4 patients (3.7%)
- Door to needle time: 91.4 min (20-296 min)
- Within 60 min (3), 61-90 min (9), 91-120 min (4), 121-150 min (3), >150 min (1)

CASC at HKWC from Mid Dec 2008 to Mid Dec 2009 (12 months)

- Average LOS in CASC: 2.17 days
- Average LOS in neurology bed: 5.04 days
- Door to CT time: 45.9 min (10-204 min)
- CT to ward time: 27.2 min (6-97 min)
- IV rPA: 20 patients (18.34%)
- IMPACT 24: 7 patients (6.4%)
- DIAS 3: 4 patients (3.7%)
- Door to needle time: 91.4 min (20-296 min)
- Within 60 min (3), 61-90 min (9), 91-120 min (4), 121-150 min (3), >150 min (1)
CASC at HKWC from Mid Dec 2008 to Mid Dec 2009 (12 months)

- Outcome of 109 patients
  - B7 ward: 5
  - Home: 31
  - Transfer out: 4
  - To neurosurgery: 6
  - To TWH for rehabilitation: 49
  - To other convalescent beds: 8
  - Died: 6
- 9 IV rPA-treated patients: 4 points or more improvement in NIHSS

Use of Stroke Registry in PYNEH

Outcomes after first-ever stroke

- Patients: 109
- Setting: Regional hospital, Hong Kong
- Main outcome measures: Disability and stroke mortality within 1 year of the first-ever stroke
- Results:
  - Mortality rate: 15.5% at 30 days
  - 30.8% at 1 year

Using the National Institutes of Health Stroke Scale (NIHSS) to predict the mortality and outcome of patients with intracerebral haemorrhage

- Objectives: To investigate whether the National Institutes of Health Stroke Scale (NIHSS) could be used to predict mortality and morbidity in patients presenting with intracerebral haemorrhage.
- Design: Prospective study at a single hospital.
- Setting: Regional hospital, Hong Kong.
- Main outcome measures: mortality and functional outcome at 3 months.

Results:
- A total of 109 patients were included in the study.
- The NIHSS was used to predict mortality with a sensitivity of 59% and a specificity of 92%.
- The NIHSS was used to predict functional outcome with a sensitivity of 59% and a specificity of 92%.
- The NIHSS had an area under the curve of 0.71.
**QMH Stroke Registry**
- Oct 1996 to Dec 2003 (7.25 yr)
- 5,588 patients
- 3,000 M & 2,588 F (M:F=1.2:1.0)
- Mean age: 70.5 yr
- Mean NIHSS upon admission: 8.96
- IS: 70%
- ICH: 17%
- SAH: 1%
- TIA: 12%
- 2004 to 2008 (5 yr): 5,178 patients
- 2009: 897 patients

**Hospital Stroke Registry**
- Improve the care of acute stroke patients
- Support development of standardized management protocol
- Facilitate audit of stroke care
- Facilitate implementation of acute therapy
- Facilitate review of stroke patients
- Facilitate selection of patients by stroke types and subtypes
- Facilitate research projects

**Conclusions**

**Thank You**