

Preventable causes of spontaneous intracranial haemorrhage in Hong Kong Chinese

JNK Hsiang, XL Zhu, LKS Wong, R Kay, WS Poon

A prospective hospital-based study involving 115 consecutive Chinese patients with computed tomography diagnosis of putaminal or thalamic haemorrhage was performed. Their demographic and clinical data were collected and analysed. Two major findings evolved from the study—the majority of patients were younger than those in Caucasian series and 49% of patients had previously diagnosed hypertension; 52% of these were not compliant with their antihypertensive medication. This study concludes that haemorrhagic stroke is a serious health problem in Hong Kong. Improvements in health education and the primary care system in the management of hypertension would help to reduce the incidence of haemorrhagic stroke.

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Key words: Cerebrovascular diseases; Hypertension; Hemorrhagic stroke; Primary spontaneous intracerebral hemorrhage; Health education; Health promotion

Introduction

Cerebrovascular diseases are the most frequent cause of death in China¹ and are the third most common cause of mortality in Hong Kong.² Among the subtypes of stroke, cerebral haemorrhage is the one most likely to require neurosurgical services and carries the highest mortality rate.³ Several studies have demonstrated that primary intracerebral haemorrhage accounts for one-third of all cerebrovascular diseases in the Chinese population living in China, Taiwan, and Hong Kong.^{1,4-6} This figure is three times higher than that found in Caucasian populations in Western countries.⁷⁻⁹ While there are studies that suggest risk factors for spontaneous cerebral haematomas,^{7,9,11} there are no known risk factors that can explain the higher incidence in ethnic Chinese.

The incidence of spontaneous intracranial haemorrhage in Hong Kong has been escalating during the past seven years (Fig 1). The social and economic costs of this disease deserve more attention from health professionals. In this hospital-based study, the natural history of 115 Hong Kong Chinese who had had a computed tomographic (CT)-diagnosed putaminal or thalamic haemorrhage was investigated. Based on the results of this study, the possible causes of the higher incidence of primary intracerebral haemorrhage in the Hong Kong Chinese population are suggested.

Subjects and methods

One hundred and fifteen consecutive patients with a CT diagnosis of putaminal or thalamic haemorrhage were admitted to the neurology or neurosurgical wards from July 1994 to February 1995. Primary intracerebral haemorrhage originating from areas other than the basal ganglion or thalamus were excluded from the study. All patients who had a history of recent head injury, drug abuse, or bleeding diatheses were also excluded.

Demographic data including age and sex, clinical data with Glasgow Coma Scale (GCS) scores, physical findings, CT findings, and the presence of hypertension, diabetes mellitus, and previous cerebrovascular disease were recorded. All patients received a

The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong:
Neurosurgery Unit, Department of Surgery
JNK Hsiang, MD, PhD
XL Zhu, FRCS
WS Poon, MB, ChB, FRCS
Department of Medicine
LKS Wong, MRCP
R Kay, MD, FRCP

Correspondence to: Dr JNK Hsiang

CT scan and some younger patients with favourable clinical outcomes also received diagnostic cerebral angiography.

The outcomes of the patients were determined six months after the haemorrhage occurred, using the Glasgow outcome scale.¹²

Results

Sixty-two men and 53 women were included in the study. The average age of the male patients was 61.1 years (range, 40-84 yr), and that of female patients was 67.6 years (range, 45-91 yr). Sixty per cent of the men were 65 years old or younger compared with 36% of the women.

Fifty-six (49%) patients had documented hypertension and approximately half of these patients (52%) were not taking regular antihypertensive medications. Interestingly, 54% of the women were compliant with taking their medication, whereas only 44% of the men were. Seventeen (15%) patients also had a history of previous cerebrovascular accident and 12 had associated hypertension. Only nine patients had a known history of diabetes mellitus.

The 6-month outcomes of these patients are shown in the Table. The mortality rate was 40% (26 men, 20 women). The average age was 65 years for men and 70.8 years for women. Twenty-six patients (22.6%) remained severely disabled at six months follow up. Most of these patients suffered from

hemiplegia. Only 24 patients (20.9%) had a good outcome.

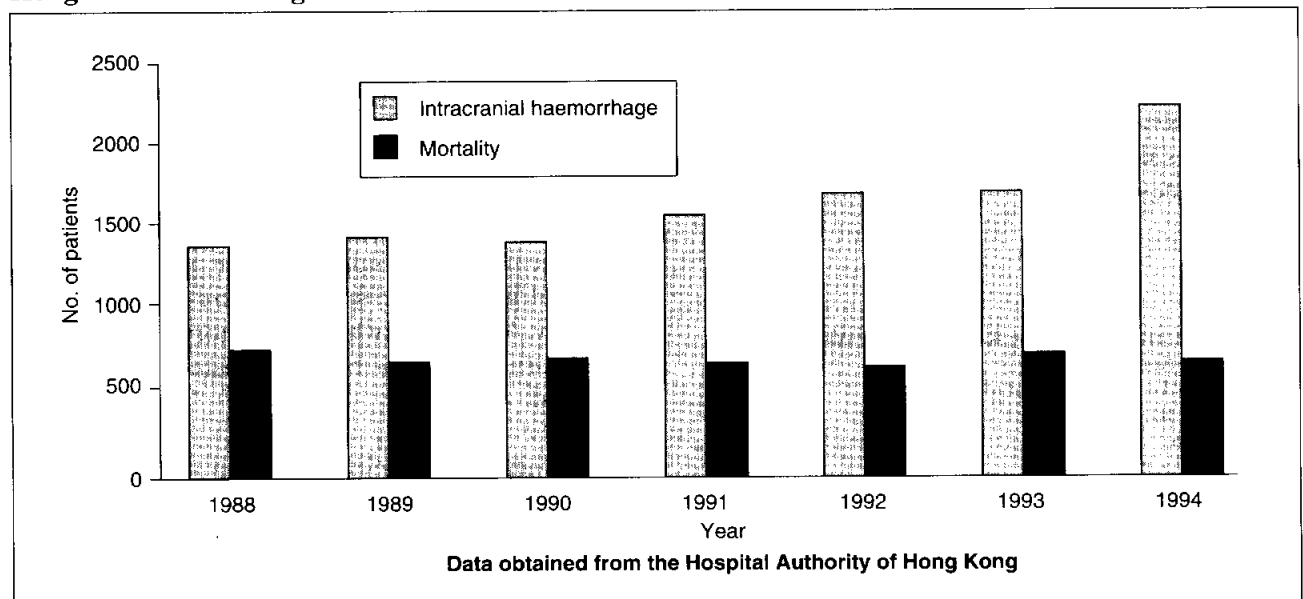
Seven patients underwent surgical decompression of the haematoma. All were younger than 60 years old. After six months, three patients had died, three were severely disabled, and one was moderately disabled.

Five patients who were younger than 50 years old and had an admission GCS score greater than 10 had cerebral angiography performed. None of the angiograms revealed vascular abnormalities that could account for the haemorrhage.

Discussion

Although this study was hospital-based, the neurosurgical service at the Prince of Wales Hospital serves a population of 1.5 million. Haemorrhagic stroke, unlike ischaemic stroke, usually has prominent clinical presentations such as acute onset of severe headache, hemiparesis, aphasia, or even coma. Most patients living in the catchment area who suffer haemorrhagic stroke arrive at the hospital within 12 hours¹³ and will be seen by the neurosurgeons. The patient selection was limited to patients who presented with putaminal or thalamic haemorrhage because these are common sites of spontaneous haemorrhage.^{7,14} The cause of the haemorrhage is generally believed to be hypertensive angiopathy of the small penetrating vessels.¹⁵ Studying the natural history of primary haemorrhage in these 115 patients gave a good estimate of the stroke-related problems in patients with primary haemorrhagic stroke.

Figure. Annual cases of spontaneous intracranial haemorrhage and the associated mortality in Hong Kong from 1988 through 1994



Two important findings emerged as a result of studying the natural histories of these patients. Firstly, unlike the western studies that claim that intracerebral haemorrhage is especially common in geriatric patients,^{16,17} this study shows that half of the patients are aged 65 years or younger, especially the male patients. This finding not only demonstrates that haemorrhagic stroke affects a younger population in Hong Kong, it also reveals a hidden socioeconomic problem created by this event. Sixty per cent of the male patients were aged 65 years or younger. They are in their productive years and the majority are the sole bread-winners for their family. Of the 60% who survived the intracerebral haemorrhage, most were disabled or unemployed after their discharge from hospital.

The second significant finding of this study is that 49% of these patients had a known history of hypertension, and, more importantly, of these, 52% were not compliant with their antihypertensive medication. This indicates a need for greater health education in this area. For those who claimed to be compliant, whether or not the hypertension was under good control is questionable. The remaining patients had no history of hypertension, although they may have had undiagnosed hypertension, as this is a chronic disease with silent symptoms until the later stage. Of course, other causes of primary intracerebral haemorrhage, apart from hypertension, are possible. We have, however, several reasons for believing that at least some of these patients had underlying undiagnosed hypertension. This study only includes those haematomas originating from the putamen or the thalamus, where hypertensive arteriopathy is the major cause of haemorrhage.⁷ In addition, this study excludes all patients with a history of drug abuse and bleeding diatheses, which are other known causes of cerebral haemorrhage.^{18,19}

Five of the younger patients underwent cerebral angiography and four underwent surgical evacuation of the haematoma. None of these patients had a previous history of hypertension and none showed any evidence of vascular malformation as the cause of haemorrhage, either radiographically or intra-operatively. The possibility of the under-diagnosis of hypertension again indicates a need for greater health education in the community.

There are still no effective therapies for basal ganglion haematomas. Whether one should choose surgical or medical management is still an unsettled matter in the neurosurgical literature.²⁰⁻²³ It is not the intention of this study to compare the validity of either

Table. Outcomes of 115 patients at 6-month follow up

Outcomes	No. of patients (%)
Died	46 (40.0)
Vegetative state	1 (0.8)
Severely disabled	26 (22.6)
Moderately disabled	18 (15.7)
Good recovery	24 (20.9)

management method. Rather, the purpose is to identify haemorrhagic stroke-related problems in Chinese living in Hong Kong. The results of this study strongly suggest that a better screening system for hypertension, and health education in our primary health care system can reduce the incidence of hypertensive stroke. Several studies have already demonstrated a decrease in the incidence of stroke in developed countries.^{24,25} The best example is Japan, where although a higher incidence of haemorrhagic stroke exists than in the West,²⁶ a significant reduction in stroke incidence has occurred.²⁴ This may be related to improvements in the social and health care systems over the past two decades.²⁶

Another good example is Singapore, where 70% of the population are ethnic Chinese. Primary intraparenchymal haemorrhage only contributes 20% of all stroke admissions, according to a hospital-based study. The average age of these patients was 67.8 years and the compliance rate for taking medication was 78% (B Sadasivan, personal communication). This higher compliance rate and lower percentage of haemorrhagic stroke are probably due to the aggressive public health education programmes in Singapore.

Unlike these developed countries, the incidence of primary intracranial haemorrhage in Hong Kong is increasing. Even though this phenomenon could be due to an increase in the number of patients diagnosed by the more frequent use of CT scans in recent years, our data agrees with the findings of other studies^{27,28} that also suggest that poor control of hypertension is the major factor causing cerebral haemorrhage. We therefore strongly believe that increased health education with concurrent hypertension screening facilities could reduce the incidence of primary intracerebral haemorrhage in Hong Kong.

The annual mortality rate for this condition is stable, which probably reflects the improved management

of these patients. Most of the survivors, however, remain disabled or unemployed, and this drains health care and social resources.

The current health care system in Hong Kong is not effectively managing this preventable cause of spontaneous intracranial haemorrhage. This problem echoes the recent editorial by Dr AS Dixon: "The health care system in Hong Kong is out of step with developments elsewhere, and its economic power has allowed it to ignore the lessons of others. This situation is unlikely to last forever, and if ignored, the crunch when it comes will be all the more severe."²⁹ Finally, let us remember what Field and Lemak said: "Treating risk factors that are believed to be forerunners of stroke is definitely preferable to dealing with the consequences of a damaged brain."³⁰

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