Stroke is one of the top five leading causes of death and one of the top 10 causes for hospitalization in Malaysia. Stroke is also in the top five diseases with the greatest burden of disease, based on disability-adjusted life years. However, prospective studies on stroke in Malaysia are limited. To date, neither the prevalence of stroke nor its incidence nationally has been recorded. Hypertension is the major risk factor for stroke. The mean age of stroke patients in Malaysia is between 54.5 and 62.6 years. Traditional medicine is commonly practiced. With the increasing number of stroke cases annually, more government and nongovernment organizations should be involved in primary and secondary prevention strategies.

Key words: epidemiology, hypertension, Malaysia, prevention, stroke burden, traditional medicine

Introduction

Stroke contributes to major morbidity and mortality in both developed and developing countries. Malaysia spans over 330,803 km². Its 28.25 million population comprises 66.1% Malays and Indigenous Malays, 25.0% Chinese, 7.5% Indians, and 1.4% other races (1). This yields a population density of 86 per km². Malaysia is categorized as a low-middle income country, with approximately US$ 13,740 per capita gross domestic product (GDP). However, the government spends only 4.75% of its GDP on health care (2).

Mortality

In Malaysia, stroke is one of the top five leading causes of death after ischemic heart disease, sepsis, malignant neoplasms, and pneumonia (Table 1). Since 2005, the percentage of deaths attributed to stroke in general hospitals has ranged from 6.6% to 8.4%. As the life expectancies in Malaysia for males and females were 72 and 76 years old, respectively, this accounts for an average of 5.5 crude death rates per 1000 population (1,3).

Prevalence and incidence

Due to the limited number of prospective studies conducted in Malaysia, neither the prevalence nor incidence of stroke has been recorded nationally (4). We describe a few studies that have been conducted in different Malaysian states.

In Kelantan, 158 stroke patients were admitted to Hospital Universiti Sains Malaysia (HUSM) between January 1997 and December 1998, of whom 86.1% were Malays and 13.9% were Chinese (5). This may reflect the local population, which is made up primarily of Malays. With regard to stroke subtype, 56.3% were ischemic stroke, 36.1% were primary intracerebral hemorrhage, and 7.6% were subarachnoid hemorrhage.

Of the 246 stroke patients admitted to Penang Hospital from December 1998 to November 1999, the majority were Chinese (55.7%), Malays (28.9%), and Indians (14.2%), while other races accounted for 3% (6). Again, this may reflect the local population, as many Chinese are found in Penang. More ischemic stroke cases (74.8%) as compared with hemorrhagic stroke cases (25.2%) were observed.

In Kuala Lumpur, 163 ischemic stroke patients were admitted to Hospital Universiti Kebangsaan Malaysia from June 2000 until January 2001, with lacunar infarct (62.6%), middle cerebral infarct territory (26.4%), and other manifestations (11.0%). The mortality rate from ischemic stroke was 11.7%, with a mean age of 62.2 years (8). In another hospital (University of Malaya Medical Centre), 83 ischemic stroke patients were admitted between June 2000 and November 2000; Chinese accounted for 40.9%, followed by Malays (30.1%), Indians (27.7%), and other races (1.2%). Again, this may be a reflection of the local population. Regardless of ethnicity and stroke subtype, hyperhomocysteinemia was found to be a risk
factor for ischemic stroke (odds ratio 5.3) (9). Depression was also reported in the majority of the patients (66%) three–six months poststroke onset (10).

It has been reported that six new stroke cases occur in Malaysia every hour (11). This figure is alarming and comparable with that reported by the World Stroke Organization (12).

We carried out a small study focusing on ischemic stroke among Malay patients \( n = 57 \) admitted to HUSM from April to August 2011. The mean age of the patients was 54.5 years, with a 3.3% mortality rate. Although previous reports have failed to provide conclusive evidence that hyperlipidemia is a predisposing factor for stroke (13), most of our patients had hyperlipidemia (Table 2), indicating that it is one of the risk factors for stroke among Malaysian patients.

### Economic impact

Throughout the world, stroke is among the five diseases with the greatest disease burden, based on disability-adjusted life years (DALY) (14). According to the World Health Organization report of global burden of disease, in Malaysia, the number of DALYs lost per 1000 population for noncommunicable diseases including stroke was 101.8. However, no previous study in Malaysia has been conducted.

### Prevention and rehabilitation

There are 334 hospitals in Malaysia, a density of 0.12 hospitals per 10 000 population. In 2009, there were only 63 and 64 registered neurosurgeons and neurologists, respectively. In terms of medical devices, 126 units of computed tomography scanners and 81 units of magnetic resonance imaging machines were available throughout Malaysia (14).

Some hospitals have traditional and complementary units that practice the traditional Malay massages, which serve as an alternative poststroke therapy (15). A nonprofit organization (the National Stroke Association of Malaysia) also provides stroke rehabilitation services for various communities within Malaysia (16).

### Traditional medicine

Traditional medicines are commonly administered in Malaysia as an alternative therapy for stroke. The Chinese consume herbs such as *Ginkgo biloba*, *Salvia miltiorrhiza*, liguistrazine,
and acahnopanax (17), while Andrographis paniculata and Centella asiatica are more commonly used by the Malays (18). These medicines are claimed to enhance microcirculation, which protects against ischemic reperfusion injury and inhibits brain cell apoptosis (19). The efficacy and potential side effects of many of the herbs, however, are yet to be scientifically proven in clinical studies.

**Conclusion**

Stroke poses a major economic burden to the country and family. We advise future Malaysian government officials to emphasize health-care development and services in view of the high number of cases annually, in order to provide effective, efficient primary and secondary prevention for stroke patients. This approach would positively impact Malaysian economic development.

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