

Strokes — A Sri Lankan perspective

J B Peiris¹

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Summary

Analysis of a hospital based study of the adult population in the city of Colombo, showed an age adjusted incidence rate of 1.89 per 1,000 population and male:female (M:F) ratio of 1.4:1, which however did not reverse after the age of 65 years, as in the developed world. While hypertension was the most important underlying cause in both sexes, diabetes and heart disease other than myocardial infarction (MI) were more important in the under 65 year female. Interestingly, over half of the over 65s and over a third of the under 65s did not have an underlying risk factor.

The autopsy study of those dying of natural intracranial causes within 24 hours of admission showed that there was extensive pathology intracranially as well as in the heart and kidneys.

Over 10% of the hospitalized stroke patients are under the age of 45 years, of whom only about a third have a known risk factor. In about 20% of the patients with mitral valve prolapse an unconnected lesion responsible for the stroke was demonstrable.

Autopsy studies have revealed an interesting new entity of Transient Emboligenic Aorto-Arteritis (T.E.A) — a luminal thrombus overlying an area of normal intima with underlying segmental medial arteritis which embolises to the intracranial vessels producing a focal neurological deficit.

Introduction

Strokes occur worldwide. No country is exempt. It is the most important cause of persisting disability and in most countries it ranks among the first five common causes of death.

Although by the bedside, the clinical manifestations of a stroke in one country does not differ significantly from that in another, there are many interesting facets which are special to a region or even unique to a country. Unfortunately, data from studies in Western countries are commonly utilized in the Asian countries. In this context, it is worth presenting a Sri Lankan perspective of strokes.

Methods

This paper presents briefly important information regarding strokes in Sri Lanka derived from 4 studies.

1. A study of admissions to the General Hospital, Colombo over a 12 month period from 1st June 1974 with a 12 month follow up¹.
2. An ongoing clinical study of strokes in the young.
3. An autopsy study of strokes in the young.
4. An autopsy study of 'sudden deaths' due to non traumatic intracranial causes.

Results

Data from stroke Registry program

Incidence

According to the WHO stroke registry program covering 17 centers in 12 countries over a period of 3 years which included Colombo, the incidence was 1 to 5 per 1000 population².

In Sri Lanka, the age adjusted incidence rate per 1000 population is 1.89, with a male:female ratio of 1.4:1, not much different from the Western scene.

The age adjusted incidence rate was 2.19 per 1000 for the male and 1.56 per 1000 for the female.

Risk at different ages

The incidence of strokes increases markedly with increasing age. From a very low figure of 0.03 per 1000 population for the under 45 year age group, the incidence rises sharply to 3.29 for the 65-74 year group and 4.07 per 1000 in the over 75 year age group.

Stroke is not a major problem in the under 40 year age group in the west, while in the developing countries it may account for as much as 10 — 20%. In Sri Lanka it accounts for 10.4% of all strokes.

Male-female differences

In most developed countries, males have a greater chance of developing strokes than females until the age of 65 years, when the ratio reverses. In the study of strokes in the city of Colombo, M:F ratio under the age of 65 years was 1.3:1, but the greater incidence of strokes in the male continued to an even greater extent in the over 65s. In the 65-74 year age group the M:F ratio was 3.86 to 2.68 per 1000 (1.4:1) and in the over 75 age group 5.79 to 2.68 per 1000 (2.15:1). In other words it means that an over 75 year male in the city of Colombo has

¹ Consultant Neurologist, Institute of Neurology, General Hospital, Colombo.

a 1 in 200 chance of developing a stroke in any given year.

Premorbid Bio Data

Hypertension

Like in the developed countries, in Sri Lanka, hypertension is the most important predisposing cause, about 40% of patients having a high blood pressure at the time of first admission. Only the young female suffering from a stroke had a low incidence of hypertension. Blood pressure was much higher in the comatose patient than in those who were alert. The most important revelation was the fact that less than half the patients with hypertension were receiving antihypertensive medication at the time of the stroke — the greatest defaulter was the over 65 year female, perhaps living up to the phrase of the 'stubborn old female'.

The mean blood pressure for the male irrespective of age was around 170/100 while the females had a mean systolic of 170 while the diastolic was 95.5 in the under 65 and 92.2 in the over 65 year group.

Diabetes

There was a history of diabetes in 15.2% over the age of 65 in both sexes. Diabetes was commonest among the young female, being 23.3% as compared with the male 7.4%. Worldwide, there is a slightly higher incidence of diabetes among women stroke patients.

Previous stroke

Among the under 65 males, 24.1% had suffered a previous stroke but only 6.5% in the over 65 year male. This may be due to the poorer survival of the over 65 year male stroke patient. Among the female, this age ratio was reversed. Perhaps this may be due to the better survival of the older female who are also known to tolerate hypertension better than other categories.

Previous myocardial infarction (MI)

In the under 65s, irrespective of sex, 10% or more had suffered a previous MI. Surprisingly only 2.2% over the age of 65 gave a history of previous MI. This is also probably due to the poorer survival of the older patient with a MI.

Heart disease other than myocardial infarction

Heart disease other than MI was low or conspicuously absent in the males and older female, but one fifth of the younger female had evidence of a previous rheumatic valvular disease.

Negative medical history

Over 50% of the over 65 year male stroke patients

did not give a past history of HT, DM or previous MI — not a reassuring revelation for the healthy old male of the species. Thus in many old people, a stroke was indeed a 'bolt from the blues'. Even in the under 65s, there were no 'predisposing factors' in as many as one third.

The hospitalized stroke patient

It is the more seriously ill stroke patient who seeks admission to hospital. It was thus not surprising that in the GHC based study more than half the patients did not leave the hospital alive (87 of 163 patients in one year = 57.5%). Of these 68% died in the first week and of them 2/3 in the first 3 days. Of those who survived, more than half stayed for longer than 30 days for management of complications and rehabilitation. Only about 15% of the survivors left hospital in the first fortnight.

Mortality Figures

When we compare the mortality figures of the hospitalized patient with the all island mortality figures it is seen that only a third of those who suffer strokes, die in hospitals. While only 1/3 of those who die, die in hospitals, 2/3 of those who are born are born in hospital. Obviously the hospital is a better place to start life than end it. Certainly an intensive care unit with tubes and cannulae surrounded by machines and masked men and women is not a good point of departure after a meaningful life.

Factors governing survival

Factors governing survival included age, conscious level on admission, blood pressure and history of previous stroke.

Age

In the first few days after the stroke, under 65 year strokes appear to do worse than the over 65s. Thereafter, survival rates were less favorable for the older patient, perhaps due to other complications.

Conscious level

There was a direct relationship with the lowest level of consciousness during the first 24 hours. Survival decreased markedly with conscious level, and this occurred almost exclusively in the first week.

Systolic blood pressure (SBP)

SBP over 200 mm on admission were related to poor survival. Systolic BP of less than 160 mm shortly after the stroke had a poorer survival than when the SBP was between 160-180 — the significance being almost exclusively in the first few days after the onset. High BP at onset while reflecting pre-existing poorly controlled HT may also indicate severity of the cerebral lesion causing stroke. In both instances poorer survival was likely.

Recovery of function

The extent of physical and mental recovery is of utmost importance to those who survive a stroke. Would they be able to lead an independent life and return to normal work and their previous life style or would they be a burden to the family and society. It is often possible to give a reliable answer on clinical grounds alone. An unfavorable prognosis is associated with age over 70 years, severe motor deficit, impairment of consciousness and impairment of mental function.

Data from autopsy study of sudden deaths

In the autopsy study, 150 unselected deaths within 24 hours of admission to hospital due to 'natural causes' over a 15 year period were analyzed.

Of the 150, 80 were due to cerebrovascular diseases 60 being due to an intracranial bleed and 20 cerebral infarction, of which 7 were due to intracranial venous thrombosis.

Of the 48 cases diagnosed as intracerebral hemorrhage before death. Only 23 were in fact intracerebral hemorrhage at autopsy. In all 23 cases, the intracerebral hemorrhage was massive extending into the ventricle, brain stem or basal ganglia in 15 cases. Another interesting finding was that left ventricular hypertrophy was found in all cases of Cerebral hemorrhage indicating that long standing hypertension was the cause. Among these 23, there were 5 under the age of 45 years — all of whom had evidence of complications of hypertension.

Of the remaining 25, ten were due to cerebellar hemorrhage — a condition amenable to urgent surgery but often not diagnosed unless a CT scan is requested. This study was done on patients admitted in the pre CT era of Colombo. Four were under the age of 30 years — one was due to a cerebellar hemangioblastoma, one secondary to a lymphatic leukaemia and no cause was apparent in the other two. There were 10 cases of subarachnoid hemorrhage — all of whom had died within 24 hours of the onset of the headache, in 6 within 3 hours of the acute episode. Eight were over the age of 40 years and in 7 of them there was LVH and diffuse atheroma. A 28 year male had bled from a cerebellar hemangioblastoma and another from an aneurysm.

Strokes in the Young — Clinical Study

In our ongoing study of strokes in the young age group of more than 150 patients, about one third had one or more predisposing factors viz hypertension, diabetes, heart disease. About 15% of the under 45 year stroke patients had an associated 'innocent Mitral valve prolapse (MVP)' which was not responsible for the stroke. We are

in the process of attempting to define a subgroup of MVP at 2D Echo who may be more liable for stroke.

It is the group without an antecedent factor/s which interests us. I shall not attempt to present the details of this study as strokes in the young is the subject of a separate presentation. It is, however, of significance to note that many of these patients appear to have thrombo-embolic strokes though they have no cardiac source of thrombo-emboli nor underlying factors which may produce a source of thrombi.

Autopsy study of strokes in the young

In this context, the findings of our autopsy study on strokes is of interest. A new clinic-pathological entity — T.E.A. — has been described from the autopsy study. In this condition there is a transient focal arteritis in the aorta or main trunks which produces a luminal thrombus which embolises in the extra or intracranial vessels. It is an important cause of non atheromatous thrombo-embolism causing strokes in the young³.

Discussion

As strokes occur worldwide and studies from the developed countries far outnumber those from the under developed and developing countries, there has been a tendency to interpolate data from such studies to the Asian scene without adequate evaluation or appropriate modification. Clinical studies with autopsy confirmation would help to identify and confirm the differences between countries with different environmental, cultural, social and nutritional backgrounds. Such differences are important in the management and planning of services and facilities for the stroke patient in the community.

Pitfalls in using such information is clearly exemplified by the fact that more than 25% of one year survivors are cared for in institutions in the developed countries while in Sri Lanka nearly all one year survivors are looked after at home by relations and friends at considerable financial loss but with much tenderness and loving care.

Additionally, stroke is not a major problem in the under 45 year age group in the west, while in the developing countries 10-20% of strokes occur in this age group.

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