Clinical pattern of hospitalized strokes in 28 hospitals in Indonesia

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Abstrak

Stroke merupakan penyebab kecacatan dan kematian yang semakin meningkat di Indonesia. Pola klinis stroke yang dirawat di rumah sakit belum banyak dilaporkan. Penelitian ini merupakan salah satu bagian dari ASNA Stroke Epidemiological Study yang bertujuan untuk meneliti pola klinis stroke di 7 negara ASEAN termasuk Indonesia dengan protokol yang sama. Dari 2065 penderita stroke akut yang dirawat di 28 rumah sakit di seluruh Indonesia, usia rata rata adalah 58,8 ± 13,3 (SD) tahun, (rentangan 18-95 tahun). Dua belas koma sembilan persen berusia dibawah 45 tahun, dan 35,8 % diatas 65 tahun. Pria lebih banyak dari wanita. Waktu tiba di rumah sakit rata rata 48,5 ± 98,8 jam (berkisar 1-968 jam) setelah serangan stroke. Sebagian besar tiba di rumah sakit di atas 6 jam setelah serangan. Alasan keterlambatan ini antara lain ketidaktahuan (56,3 %) dan kesulitan transportasi (21.5 %). Gejala yang paling menonjol adalah kelumpuhan dan gangguan bicara / bahasa. Faktor resiko tersering adalah hipertensi, penyakit jantung, merokok dan diabetes mellitus. Stroke berulang dijumpai pada sekitar 20 % kasus. Jenis stroke terbanyak adalah stroke iskemik. Sebagian besar keluar rumah sakit dalam keadaan hidup dan membaik.

Abstract

Stroke is the increasing cause of morbidity and mortality in Indonesia. Data on clinical pattern of hospitalized Indonesian stroke patients is still not available. This study is a part of ASEAN Neurological Association (ASNA) Stroke Epidemiological Study aimed to investigate clinical profile of stroke in 7 ASEAN countries with the same protocol. From 2065 acute stroke patients admitted to 28 hospitals all over Indonesia, mean age was 58.8 ± 13.3 (SD) year (range : 18-95 years). 12.9 % were younger than 45 years, and 35.8 % were older than 65 years. There were more men than women. Mean admission time was 48.5 ± 98.8 hours (range: 1-968 hours). Most of them arrived at hospital more than 6 hours from the onset of stroke. The reasons for delayed admission were unawareness of stroke symptoms and long distance transportation. The most frequent stroke symptoms were motor disability. The most common risk factors were hypertension, heart diseases, cigarette smoking and diabetes mellitus. Recurrent stroke was found in nearly 20 % patients. Ischemic stroke was the most frequent and the majority of the study subjects were discharged alive and improved .

Keywords : *Stroke , clinical pattern , hospital- based study*

Stroke is still the major cause of death and disabilities in developed countries, although recent epidemiological data showed a decreasing tendency of stroke mortality in those countries.[1] Indonesia as a developing countries with the population of more than 200 million people (the fourth largest population of the world) has little documented nation-wide data of stroke epidemiology, either hospital or community-based statistics. A limited hospital-based stroke survey revealed the growing tendency of stroke cases especially in urban hospitals in Jakarta.[2] The availability of accurate stroke data are very important for national stroke combating programs all over Indonesia. This is the first large scale hospital-based stroke study involving the urban and rural areas in Indonesia. This study is a part of ASNA Stroke Epidemiological Study performed in seven ASEAN member Countries by ASNA Standing Committee For Stroke, from October 1996 until March 1997.

This article presents descriptively the demographic characteristics, clinical pattern, risk factors, type of stroke, arrival time, length of hospital stay and hospital discharge status of stroke patient in Indonesian population.

METHODS

Over a 6-month period from October 1996 to March 1997, we prospectively evaluated consecutive series of acute stroke patients admitted to 28 hospitals all over Indonesia. These hospitals represented most of the areas with dense population in Indonesia involving Java, Sumatera, Kalimantan and Sulawesi island. Thir-

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teen hospitals located in Jakarta and 15 hospitals were outside Jakarta. The participating hospitals consisted of 14 University-affiliated hospitals and 14 private or semi private hospitals in urban areas.

Diagnosis of stroke was made clinically by participating neurologists in those hospitals using the World Health Organization criteria, i.e. "rapid developing clinical signs of focal or global disturbances of cerebral function lasting more than 24 hours or leading to death with no apparent causes other than that of vascular origin". If CT scan is available , it should be done for confirmation.

All the subjects were assesed by participating neurologists and the following parameters were noted: demographic characteristics (age, sex, and etc.), hospital arrival time, reasons for delayed admission (more than six hours), clinical features, risk factors, type of stroke (by CT Scan), length of hospital stay and hospital discharge status.

Clinical data were stored in a preprepared floppy disk and descriptive statistics were applied using Statistical Program For Social Science (SPSS) 6.2 for Windows 95.

RESULTS

Demographic characteristics

During the period of the study, 2065 patients with acute stroke have been evaluated. Mean age was 58.8 ± 13.3 years (ranged 18 – 95), higher in women (60.4 ± 13.8 years) than in men (57.5 ± 12.7 years). The age distribution showed that 12.9% of the stroke patients were younger than 45 years old and 35.8% above 65 years. The sex distribution showed a slight prevalence of men (53.8% vs 46.2%). (Table 1)

Hospital admission time

The mean time between onset of symptoms and hospital arrival was 48.5 ± 98.8 hours (ranged 1 – 968 hours). Cumulatively, 21.1% of the patients were admitted within 3 hours, 32.7% within 6 hours, 44.8% within 12 hours and 50.2% within 24 hours from stroke onset. (Table 1)

The reason for delayed admission were as follows : 56.3% unawareness of having a stroke, 21.5% transportation problems, 11.8% taking traditional medicine, 4.2% visiting traditional healer and 6.2% unknown (Table 2)

Table 1. Characteristics of study subjects

No. of patients	2065
Mean age, y (SD)	58.8 (13.3)
< 45	12.9%
45 – 65	50.5%
> 65	35.8%
Sex, M / F	1108 / 944
Mean Admission Time, h (SD)	48.5 (98.8)
< 3 h	21.1%
3 - 6 h	11.6%
6 – 12 h	12.1%
12 – 24 h	5.4%
> 24 h	49.8%
Mean Length of hospital stay, d (SD)	10.9 (9.6)
1 – 7 d	42.8%
7 – 21 d	46.1%
21 – 28 d	5.6%
> 28 d	

Table 2. Reasons for delayed admission

No. of delayed patients	1385
Unawareness of having a stroke	56.3%
Transportation problem	21.5%
Taking traditional medicine	11.8%
Visiting traditional healer	4.2%
Unknown	6.2%

Signs and Symptoms

Of the 2065 stroke patients, motor disability was the most prominent clinical feature (90.5%) followed by headache (39.8%), dysarthria (35.2%), sensory disability (27.3%), vomiting (22.3 %) and dysphasia (15.6%) and the less frequent sign was carotid bruit (0.3%). The other clinical features were summarized in Table 3.

Table 3. Clinical features of the stroke patients

Symptoms and signs	n	%
Motor disability	1865	90.5
Sensory disability	562	27.3
Visual disorders	78	3.8
Dysarthria	724	35.2
Dysphasia	321	15.6
Headache	819	39.8
Migraine	9	0.4
Vomiting	459	22.3
Vertigo	196	9.5
Unconscious	196	9.5
Seizure	185	9.0
Dysequilibrium	79	3.8
Carotid bruit	7	0.3
Carotid stenosis	14	0.7

Risk Factors

The most common risk factors for stroke in our study were hypertension (73.9%). Thirty one point five percent of the hypertensive stroke patients were treated, 33.5% untreated and 8.9% diagnosed after admission. Smoking was the second most frequent risk factor (20.4%) and 13.5% of them were recent smokers. The other major risk factors were prior stroke, ischemic heart disease and diabetes mellitus (19.9%, 19.9% and 17.3%, respectively). Seven point two percent of the diabetic stroke patients were treated, 5.2% untreated and 4.9% diagnosed after admission. The mean serum cholesterol level was 209.3 ± 55.8 mg% (range 50 – 855) and 37.2% below 200 mg%, 26.0% in the range of 200 – 250 mg% and only 16.4% above 250 mg%. Mean hematocrit value was 40.0 ± 6.4 vol % (range 30 – 53) and 1.7% of the subjects had the hematocrit above 50 vol%. (Table 4)

Table 4. Risk factors of 2057 study subjects

		n	%
Prior stroke		409	19.9
Prior TIA		73	3.5
Prior stroke + TIA		23	1.1
Hypertension	- treated	647	31.5
	- untreated		33.5
	- diagnosed after admission	182	8.9
	- unknown	77	3.7
Diabetes Mellitus	- treated	149	7.2
	- untreated	106	5.2
	- diagnosed after admission	100	4.9
	- unknown	117	5.7
Cigarette Smoking	- recent	277	13.5
	- < 5 y	87	4.2
	- 5 – 10 y	33	1.6
	- > 10	23	1.1
	- unknown	5	0.2
Contraceptive Pills		31	1.5
Alcohol		29	1.4
Atrial fibrillation		121	5.8
Ischemic heart disease		410	19.9
Valvular heart disease		71	3.4
Congestive heart disease		74	3.6
Mean serum cholesterol		209.3 ± 55.8 mg %	
range	: 50 – 855 mg %		
< 200			12.9 %
200 – 250			24.0 %
> 250			16.4 %
Mean hematocrit		40.0 ± 6.4 vol %	
range	: 30 – 53		
< 50			98.3 %
> 50			1.7 %

Classification of stroke

CT scan was done on 61.9% of the study patients and the mean time from onset to CT was 2.9 ± 3.9 day (median 1.0 and range 1 – 48 day). The diagnostic classification based on CT finding, were non lacunar anterior circulation (27.0%), lacunar 11.7%, intracerebral hemorrhage (18.5%), non lacunar posterior circulation 4.2%, subarachnoid hemorrhage (1.4%) and 38.1% undetermined (without CT).

Hospital discharge status

Table 5 shows that 56.9% of our study patients were alive-with improved condition whereas 4.3% patients had a worsening condition.

The overall mortality of the stroke patients was 23.3%. The death rate was higher in hemorrhagic (28.4%) than in ischemic stroke (21.2%). The patient with non lacunar anterior circulation showed higher mortality (15.2%) than patients with posterior circulation (2.5%), while the lacunar infarction patients showed a very low death rate (3.5%).

Table 5. Type of stroke and hospital discharge status of the study subjects

Total subjects	2057	
No. of patients with CT Scan	1274	(61.9%)
- abnormal	1102	(53.6%)
- normal	172	(8.3%)
Type of stroke		
- lacunar		11.7%
- non lacunar anterior circulation		27.0%
- non lacunar posterior circulation		4.2%
- subarachnoid hemorrhage		1.4%
- lobar hemorrhage		8.8%
- ganglionic hemorrhage		7.1%
- brainstem hemorrhage		1.7%
- cerebellum hemorrhage		0.9%
- unknown (without CT)		38.1%
Hospital discharge status		
- alive - improved		56.9%
- alive - unchanged		1.6%
- alive - worsened		4.3%
- alive status not recorded		5.1%
- dead		23.3%
- unknown		9.7%

Length of hospital stay

Overall mean length of hospital stay was 10.9 ± 9.6 days (range 1 – 96 days). For those surviving, the mean

length of hospital stay was 11 days for ischemic stroke and 17 days for hemorrhagic stroke.

DISCUSSION

Most of the hospitalized stroke patients in this study were in the age group of 45-65 years with the slight prevalence of men. Stroke in the young adults and in the old age people comprised of 12.9 % and 35.8 % respectively. This findings were not so different from the western literatures[3-6] or some Asian countries.[7,8]

The majority of stroke patients arrived at hospitals more than six hours after stroke onset and only one-fifth of the patients arrived within less than six hours. The reasons for delayed admission were unawareness of having a stroke and transportation problems. This fact showed that most of our people were not familiar with stroke symtoms and unaware of the emergency of this brain attack. Some foreign investigations on the arrival time of stroke also showed the same problems. It was concluded that community education for the early sign of stroke and ambulance service for quick hospitalisation have the key role in saving the patients. Anticipation of the thrombolysis and neuroprotective therapy for stroke will give best results if it is done within 3 hours from stroke onset.[7-13]

Clinical Features

Clinical features of our stroke patients showed motor disability as a prominent clinical feature followed by headache , dysarthria , sensory disorders and dysphasia respectively. This findings showed the importance of physical rehabilitation and speech therapy for Indonesian which must be done intensively and as early as possible in accordance with the clinical stability, in order to improve the quality of life and to avoid the severe disability as a sequelae of stroke . Headache is a common symptom in stroke and it was found in nearly 40 % of the stroke patients in this study. Vestergaard K revealed that headache occurred in 50 % of patients with intracerebral hemorhage, in 26 % with infarction, and in 15 % of patients with lacunar stroke.[15] Further study is required to investigate headache characteristics in Indonesian stroke patients.

Risk factors

Hypertension was the most prominent risk factor (73.9%) and almost half of the hypertensive stroke patients were not treated. Hypertension as a strong risk factor for stroke was undebatable. Many studies showed the consistent close relationship between the hypertension and the occurrence of stroke.[15-19]

Smoking is the second most frequent risk factor in Indonesian stroke patients and several studies showed that cigarette smoking is closely associated with the occurrence of cerebrovascular diseases[20] and it has been considered to be an independent modifiable risk factor.[21]

Ischemic heart disease was found in 19.9 % of the study subjects. In Framingham Study , if multivariate analysis was used , risk of stroke was increased twofold in the presence of coronary heart disease and threefold with electrocardiographic left ventricular hypertrophy. So, prevention of these risk factors represents a cornerstone of cardioembolic stroke prevention.[22]

Diabetes mellitus was found in 17.3% of our stroke patients. Most of the diabetic patients were unproperly controled. Association between stroke and diabetes mellitus has been reported in many literatures. Case control studies of stroke patients and prospective epidemiological sudies have confirmed an independent effect of diabetes with a relative risk of ischemic stroke in persons with diabetes from 1.8 to 3.0.[25]

Atrial fibrillation was found in 5.8 % of our stroke patients. Atrial fibrillation is the most powerful and treatable cardiac precursor of stroke, almost half of cardioembolic strokes occur in the setting of atrial fibrillation especially non valvular type.[23, 24]

The other risk factors found in a small number of patients were congestive heart disease , prior TIA, valvular heart diseases, policythemia, oral contraceptive pills and alcohol consumption, respectively.

Hypercholesterolemia (defined as total cholesterol level > 250 mg%) was found in 16.4 % of stroke patients.[26] Although hypercholesterolemia is an important modifiable risk factor for coronary heart disease, the link to ischemic stroke remains uncertain.[27]

Carotid bruit was found in only 0.3 % of the study subjects because the examination of cervical bruit may be not routinely done on every stroke patients in Indonesia or as some studies revealed that small vessel diseases are more frequent in Asian stroke patients. Population-based studies indicate that cervical or carotid bruits are present in about 4 % to 5 % of persons older than 45 and increases with age.[28]

Stroke recurrence

Stroke recurrence was found in 19.9% of patients. This finding showed that recurrent stroke was higher in Indonesian stroke patients compared with that reported in some literatures.[29]

Type of stroke

Because CT Scans were not available in all hospitals, especially in rural areas in Indonesia, only 61.9 % of the study patients were confirmed by CT scan. Ischemic strokes accounted for 42.9 % and these included lacunar infarction (11.7 %), non lacunar anterior circulation (27.0 %) and non lacunar posterior circulation (4.2 %). Hemorrhagic stroke was detected in 18.5 %, whereas subarachnoid hemorrhage was rare (1.4 %). About 39.1 % of patients were with undetermined cause of stroke because CT scans were not done. The frequency of stroke type or subtype in this study was rather low compared with the other investigator.[30] This might be caused by the different classification used by the investigators and large number of patients without CT scan investigation in our study.

Stroke outcome

Although most of stroke patients were discharged alive and improved from the hospitals, however, hospital mortality was found in 21.2% for ischemic stroke and 28.2% for hemorrhagic stroke. This data showed higher results than in western literature.[31,32]

Length of hospital stay

Mean length of stay of survived stroke victims was 11 days for ischemic stroke and 19 days for hemorrhagic stroke. The result revealed that non-medical bed-days were low in most of the hospitals in Indonesia because majority of our patients were low social economy and no insurance coverage. Mayo et al (1997) reported that non-medical bed-days were high in stroke patients with health insurance status and high social economic strata.[33]

In conclusion, we have presented the clinical data on stroke profile involving most of the hospitals in Indonesia and this descriptive data will be the starting point of further investigations on various nation-wide stroke researches in Indonesia.

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