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Research Article

STUDY OF PREVALENCE OF STROKE AND ITS CORRELATION WITH SIRIRAJ SCORE & RADIO IMAGING WITH OUT COME OF PATIENTS

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ABSTRACT
Aim of the study was to find out prevalence of stroke in relation to different causes & its correlation with Siriraj score with imaging and outcome in those patients. It's a prospective type of study. Total of 120 patients of stroke were admitted in tertiary care centre between sep 2012 to august 2013 at NIMS hospital. We have done the clinical examination along with history, routine investigation and CAT scan and then compared the results with CAT scan reports and siriraj scoring. Prevalence of stroke was more in males, Most common risk factor was hypertension. Headache and high Diastolic BP act as predictor of haemorrhage. In this study we seen there was no correlation between siriraj score and clinical outcome of patients. Also we have found that patients diagnosed as haemorrhagic stroke have poor outcome.

Keywords: *Stroke, Siriraj Score*

INTRODUCTION
Stroke is a devastating illness and is the most common cause of severe disability in adult. The average incidence of stroke is about 2:1,000 population, and the risk of stroke increases with age such that after the fifth decade, the incidence doubles with every decade of life. Data from the Framingham study showed that the incidence of stroke rises exponentially from 1 to 2 per 1,000 in the 45 to 54 years old age group to nearly 10 per 1,000 in the 65- to 74 years old age group. For persons of 75 to 84 years old, the incidence rises to nearly 20 per 1,000. As the incidence increases with age, so too is the prevalence. Stroke prevalence is about 6:1,000 population and prevalence of stroke disability is 4:1,000. In developed countries, the incidence of stroke has been steadily decreasing since 1960's and the initial fall in incidence was largely attributed to better control of hypertension. Subsequent fall in incidence was due to better control of other risk factors such as heart disease, diabetes, smoking and obesity. However stroke remains a major cause of death and consistently the third most common cause of death after heart disease and cancers. The economic and psychosocial cost of stroke is tremendous, Adams and Merrett (1961).
In the USA it is estimated that there are 3 million stroke survivors, with nearly 0.5 million new or recurrent strokes per year. The cost of treatment and rehabilitation is about US 40 billions per year. In Australia, there are 40,000 stroke cases per year. Stroke accounts for 10% of all deaths and 25% of chronic disability. The direct and indirect cost excluding cost from loss of earning is AUS 1.7 billion annually, Adams and Merrett (1961).
There are no national figures on stroke but hospital records do show progressive increase in stroke discharges and deaths at government hospitals. Every year about 2,500 deaths and 12,000 stroke discharges are recorded in government hospitals. As the country progress the importance of stroke will increase because of improved longevity and higher proportion of elderly population. CV Stroke is a major cause of mortality all over the world and third leading cause of medically related deaths and 2nd most frequent cause of neurological morbidity with prevalence of 1.54/1000 population and death 0.6/1000 in Indian population, Adams and Merrett (1961).
Stroke causes an acute focal neurological deficit lasting more than 24 hours resulting from the disease of cerebral vessels. Major causes *are* thrombo-embolic event and hemorrhage due to leaking of blood vessels. Both types have different clinical features as well as different prognostic and therapeutic implications. So, quick and correct diagnosis is very important of management and prognosis of patient. Along with clinical features, various scoring systems like siriraj score, Guy's score, greek score, allen score which are useful where scan and other investigations are not available. In recent years, easy

availability of CAT Scan, MRI and lack of awareness about specificity and sensitivity of these scoring system, scoring systems are not popular. Among the various scoring system, Siriraj scoring system is relatively easy and can be calculated on admission with simple clinical criteria. Diagnostic sensitivity for hemorrhage and infarct are 89.3% and 92.3% respectively, with overall predictive accuracy of 90.3% as reported in Poungvarin *et al.*, Bangkok study, Thailand, Adams and Merrett (1961).

As in our country, many patients from Lower Socio Economic Class and elderly who don't afford cost of scan and serious clinical situation of the patients, this scoring system can be used to find cause and judge prognosis. In this study of 100 cases of CV accidents in our hospital (in whom radio-imaging study in form of CAT scan/ MRI was possible) to diagnose them by siriraj score and then by radio-imaging to find out accuracy of clinical methods, Adrian *et al.*, stroke essentials (2nd edition).

MATERIALS AND METHODS

A prospective study consists of 120 patients of stroke admitted in our hospital. At the time of admission detail clinical history, physical examination carried out with special attention to mode of onset, presence of diastolic hypertension, level of consciousness, abnormalities of cognitive function, and degree of motor weakness we recorded in all patients. Risk factors like age, sex, family history, hypertension, ischemic heart disease, valvular heart disease, transient ischemic attack, smoking, obesity were noted. General examination was done which includes vital data, thorough CNS examination, and quick examination of other systems noted along with all routine investigations.

Clinical outcome consider as "good" if there is survival with improvement in focal neurological deficit, while "poor" if there is death or worsens or no improvement in focal neurological deficit.

RESULTS AND DISCUSSION

120 patients with diagnosis of acute CVA were studied clinically and with CAT scan. We observed following facts.

Table 1: Age and sex distribution

Age Distribution	Male	Female	Total
25-40	10	3	13
41-55	17	8	25
56-70	31	25	56
71-85	9	11	20
>85	5	1	6
TOTAL	72	48	120

As seen in table, 56-70 year age group was most vulnerable period for CVA, significant 46.66% Prevalence is more in male than in female, with ratio of 3:2.

Table 2: CAT scan diagnosis in the study

CAT scan	No.
Infarct	86
Hemorrhage	34
Total	100

CAT scan findings were diagnostic of infarct in 86 patients, while 34 were having hemorrhagic stroke.

Table 3: Showing distribution of the variables included in siriraj stroke score

Variables	No of Pts	Diagnosis by CAT scan	
		Infarct	Hemorrhage
LOC			
Alert	95	78(90.69%)	17(50%)
Drowsy/stuperous	13	7(8.13%)	6(17.64%)
Coma/ semicoma	12	4(4.65%)	8(23.52%)
Vomiting	13	7(8.13%)	6(17.64%)
Headache	11	3(3.4%)	8(23.52%)
Atheroma marker	33		
DM	18	15(17.44%)	3 (8.82%)
IHD	15	12(13.95%)	3 (8.82)
Interittent Claudication	0	0	0
Diastolic BP			
<80	13	11(12.79%)	2(5.88%)
81-100	51	47(54.65%)	4(11.76%)
101-120	36	22(25.58%)	14(41.17%)
121-140	14	8(9.30%)	6(17.64%)
140-160	6	1(1.16%)	5(14.70%)

Vomiting and headache were complaint by only 13 & 11 patients. In which hemorrhage were found to be present along with vomiting in 17.64% and headache in 23.52 %. While prevalence of these symptoms was very less in infarct. All 13 patients who had vomiting, 6 patients had ICH and 7 had infarct. Scan of 11 patients with headache, 8 had hemorrhage and 3 had infarction. Headache was a predictor of hemorrhage than vomiting.

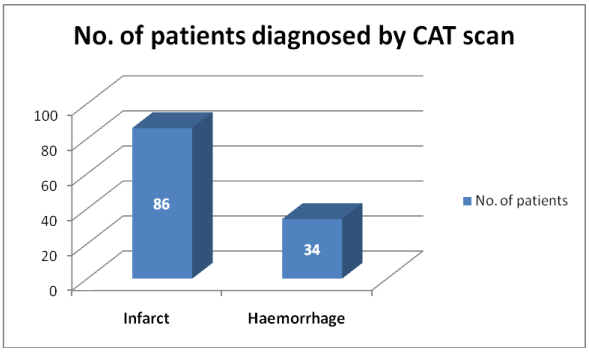
5 patients who had diastolic BP of 160 mmHg had hemorrhage and 1 had infarction. Total 14 patients who had diastolic BP >120 mmHg, out of which 8 (9.30%) had infarct and 6 (17.64%) had hemorrhage in CAT scan. Raised diastolic BP considered as a predictor of hemorrhagic stroke.

Table 4: Comparison of various parameters between heamorrhage and infarct

PARAMETER	SIRIRAJ STROKE SCORE	
	INFARCT	HEMORRHAGE
SENSITIVITY	91.37%	76.19%
SPECIFICITY	76.19%	84.12%
PPV	91.37%	76.19%
NPV	76.19%	84.12%
EFFICIENCY	87.34%	88.09%

Out of 86 cases of infarction, siriraj stroke score had made a correct diagnosis in 62 cases, incorrect diagnosis in 19 cases and was uncertain in 5 pts.

Out of 34 patients with hemorrhage the siriraj score had made a correct diagnosis in 21 patients and incorrect diagnosis 7 cases and was uncertain in 6 cases.



We did not observe any positive correlation between siriraj score and clinical outcome of patients neither in infarct nor in heamorrhage**.**

Of the 120 consecutive cases of stroke fulfilling our criteria, taken up for study were near equal representation of both gender and patients of all adult groups were studied.

Cerebral haemorrhage is found in 5-10% of patients with stroke in Europe and America, Kurtzke, *et al.*, (1985), but in developing countries the lesion is far commoner, partly because of poorly controlled hypertension. At Siriraj Hospital cerebral haemorrhage accounted for 40-50% of cases of stroke, Viriyavejakul and Poungvarin (1982). It is well established that the management and prognosis of the acute stroke syndrome vary depending on the diagnosis of haemorrhage or infarction. Hence it is crucial to establish the correct diagnosis as soon as Possible, Poungvarin *et al.*, (1991).

The diagnosis of pathological subtypes of stroke is the most important prerequisite for proper management of stroke. Non-contrast computed tomography (CT) scan is the gold standard for distinguishing stroke sub-types, Sandercock *et al.*, (1985), Wadhwani *et al.*, (2002). It is cheaper than magnetic resonance imaging (MRI), but is still expensive and inaccessible for most resource poor settings. To overcome these difficulties and to enhance clinical bedside diagnosis, clinical stroke scores have been developed. Systematic diagnostic approaches studied here can be used as guide to treating physicians where computed tomography facility is not available. In these areas, the clinical scoring system can play a role in differential diagnosis of acute stroke syndrome and to some extent selectively utilization of higher diagnostic facilities (Soman *et al.*, 2004).

The clinical parameters used in the scoring systems lay particular emphasis on apoplectic onset, headache, vomiting and LOC, which are commonly seen in ICH. These cases are predicted by clinical scores to have hemorrhage and may lose benefit of early anti platelet therapy. In our study we found that a significant 24 patients could not be certainly diagnosed as infarct and if CAT scan was not obtained, we would not have started anti platelet therapy in these patients. This finding suggests selectivity and thoughtful utilization of siriraj score particularly when result are equivocal. Study done by Weir & Murray, suggest that CAT scan becomes more preferable. Neither score is useful for exclusion of haemorrhage before anticoagulant treatment is initiated or as a diagnostic screening procedure for trials of low-risk treatments such as aspirin. Thier findings emphasise the need for routine CT scanning in this setting, since this method remains the most accurate for differentiating between haemorrhage and infarction, Weir *et al.*, (1994). All current evidence suggests that neuroimaging is the only reliable investigation for the diagnostic evaluation of the type of stroke, Kidwell *et al.*, (2000). The evolution of interventions to treat acute infarction or haemorrhage (e.g. thrombolysis, clot evacuation, surgical recanalization) in recent years has resulted in neuroimaging strategies playing an increasingly important role in the initial evaluation of stroke patients. Many specific techniques—MRI, CT, positron emission tomography, single photon emission tomography, catheter angiography and ultrasound imaging—have been developed and are available for mainstream use, Lalit (2003)

If the clinicians solely depend on these scoring system and start anti platelet therapy, sometimes may end up in the fulminant & recurrent hemorrhage resulting from further leakage of ruptured and sealed vessels (Thus suggests that neuroimaging is the only reliable investigation for the diagnostic evaluation of the

type of stroke), Badam *et al.*, (2003). Thus if we plan to start an anti-platelet therapy, it's always better to have CAT scan or other more specific test rather than clinical scoring system.

In our study, 44 patients had poor outcome, out of which 24 (54.55%) were alert, 9 (20.45%) drowsy/stuperous and 11 (25%) in semi coma/coma. Those patients who were in coma/semi coma had poorer outcome. Total 12 patients were in semi coma/com out of which 4 patients died and rest had poor outcome. And those 4 patients died, had hemorrhage on Cat scan and rest 8 patients had large/multiple infarcts.

In our study total 34 patients were diagnosed as hemorrhagic stroke on CAT scan. Out of which 5 (14.70%) patients died and 26 (76.92%) had a poor outcome. That indicates hemorrhagic stroke has a poor prognosis.

In our study, correlation between Siriraj score and clinical outcome of patients was not found.

Summary

In this prospective study, clinical diagnosis of stroke - hemorrhagic vs. non hemorrhagic, was first done on hospitalization by siriraj score and then compared by confirming it by CAT scan.

The summary of salient features of the study is as follows:

Male: female ration was 3:2 and peak incidence in the age group 41-70 years. Hypertension 56(47%), smoking (33%), IHD (12.5%), DM (15%) were important risk factors in that order. Headache was a better indicator of hemorrhage as compared to vomiting because 23.52% patients of hemorrhage had headache while 17.64% patients of hemorrhage had vomiting. Atheroma markers, TIA and heart disease predisposes to ischemic stroke but less to hemorrhage. High Diastolic BP was one of the predicting factor for hemorrhage. Out of 120 cases imaging studies demonstrate non hemorrhagic stroke in 86 and hemorrhagic stroke in 34 patients. Out of 120 cases, a/c to siriraj score system (SSS) 62 were clinically diagnosed as non hemorrhagic stroke, 21 were hemorrhagic stroke and 11 had equivocal result. In our study we found that the SSS had sensitivity of 91.37% for infarction and 76.19% for hemorrhage with predictive accuracy of 87.34%.

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