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A Clinical Study of Acute Haemorrhagic Stroke

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ABSTRACT

Objective: To study the clinical presentation, risk factors associated with haemorrhagic stroke. And to study the clinical and radiological parameters that can help to predict in-hospital mortality.

Methods: In this prospective study 50 patients above 18 years of age with CT scan diagnosed intracranial Haemorrhage attending MGM Hospital Emergency Department for treatment from December 2014 to June 2016 were included.

Results: Majority of patients were males. Hypertension 76% was a major risk factor with majority of hypertensives were on Irregular treatment. Other risk factors were alcohol consumption, smoking, anticoagulation therapy etc., Mortality was 90% with GCS < 8 and 100% with pontine bleed. The lethal outcome was significantly associated with age, male sex, SBP> 180, DBP>110, bilateral extensor planters, volume of hematoma>30 cc , presence of Midline Shift and intraventricular extension on CT scan.

KEYWORDS | Hemorrhagic Stroke, Intracerebral Haemorrhage (ICH), Glasgow Coma scale(GCS)

INTRODUCTION

Stroke or Cerebrovascular accident (CVA), is the commonest neurological emergency and is rated third amongst the causes of death in the world behind Heart diseases and cancer. CVA or strokes are capable of causing crippling morbidity in young and elderly. It has a high mortality of 40-50% and leaves survivors with a greater disability compared to ischemic stroke.[1]

Stroke can be broadly divided into Ischaemic and hemorrhagic strokes. Ischemic strokes accounts for 87% of all the strokes, Hemorrhagic strokes are subdivided into intracerebral (accounting for 10% of all strokes) and nontraumatic subarachnoid haemorrhage (accounting for 3% of all strokes). Therefore Intracerebral haemorrhage accounts for 8-13% of all strokes.[2]

The gap in medical knowledge between the ischemic and haemorrhagic type of stroke is surprising. Whereas the ischaemic side has been extensively evaluated by an impressive amount of pathophysiological studies as well as of clinical trials, intracerebral haemorrhage (ICH) has been so far a relatively neglected medical issue, addressed by a handful of trials.[3]

Effective therapies for hemorrhagic stroke are not available, treatment is primarily supportive and outcome remains poor, hence it becomes important to recognise all the risk factors for this serious sub-type of stroke, as only interventions at the primary and primordial level can help to prevent mortality and morbidity associated with hemorrhagic stroke. Intracerebral haemorrhage, is a devastating disease. The overall incidence of spontaneous ICH worldwide is 24.6 per 100,000 person-years.[4] The 30-day mortality rate ranges from 35% to 52% with only 20% of survivors expected to have full functional recovery at 6 months.[5] Approximately half of this mortality occurs within the first 24 hours, highlighting the critical importance of early and effective treatment in the Emergency Department (ED).

Differentiation of the stroke syndromes in cerebral haemorrhage or vascular occlusion is notoriously difficult clinically. The advent of Computed Tomography(CT) in the early 1970s facilitated the diagnosis and better management of stroke.

Hence this study was performed to evaluate the varied modes of clinical presentation, different risk factors, clinical and neuroradiological parameters that would help to predict the outcome of hemorrhagic stroke.

Based on neuroimaging, recent studies have determined the stroke subtypes and the ratio of cerebral infarct to haemorrhage range as 1.86:1 to 2.21:1.9 in Indian studies. Hence, cerebral haemorrhage is proportionately higher in the Indian community than in Western countries, where the ratio of infarct to haemorrhage is 5:1.[6]

METHODS

Study design and patient population:

In this prospective study 50 patients 18 years of age and above including both sexes with CT scan diagnosed intracranial Haemorrhage attending MGM Hospital, Navi Mumbai Emergency Medicine Department for treatment from December 2014 to June 2016 were randomly selected .

Inclusion Criteria: 1. Patients equal to or above 18 years age of both sexes 2.Patients diagnosed as having spontaneous intracerebral haemorrhage on CT

Exclusion Criteria: 1.Head injury 2. Stroke due to infarct or emboli 3.Primary or Secondary brain tumours

DATA COLLECTION:
Data regarding different risk factors in detail has been collected by interviewing patient's attendants/ relatives or the patient himself. Clinical parameters at the time of admission like the level of consciousness, GCS score, blood pressure, presence of gaze palsy, bilateral plantar extensor response, pupillary abnormalities, ataxic respiration were assessed in all cases. CT Scan was analysed for parameters like site, volume of haematoma, presence of midline shift, hydrocephalus and intraventricular extension of haemorrhage. Prognostic factors were studied and outcome was assessed in terms of in-hospital mortality.

RESULTS:
Among 50 cases of hemorrhagic stroke studied, there were 37 males and 13 females. 37(74%) of the study group belonged to 50 years of age and above, with maximum 19(34%) were in 50-59 years age group. The youngest patient was 28 years old and the oldest patient was 80 years old. Overall Mean Age of the study group was 56.62±12.46 years. , Statistically, there is no significant difference was observed in the incidence between sexes. (X^2=1.60; P<.206)(NS)**(Figure 1)**

Figure 1: Distribution of patients with respect to age and sex
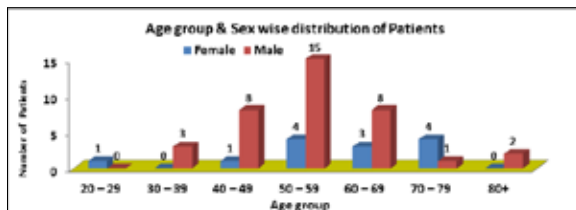
Table -1: Presenting Complaints of Patients

Presenting Complaints	Sex				Total	
	Female		Male			
	N	%	N	%	N	%
Altered Sensorium	10	76.9	23	62.2	33	66.0
Weakness of limbs	13	100.0	37	100.0	50	100.0
Seizures	2	15.4	3	8.1	5	10.0
Headache	4	30.8	13	35.1	17	34.0
Vomiting	4	30.8	8	21.6	12	24.0
Headache with Vomiting	2	15.4	11	29.7	13	26.0

Table 1: Shows the presenting complaints of patients. overall the headache at onset was present in 60% of the patients, vomiting in 54 % of the patients, both headache and vomiting were seen in 26% of subjects .Altered sensorium was present in 66% and hemiparesis was present in 100% of the patients ,also there were seizures in 10% of subjects.

Table 2: Distribution of spontaneous ICH patients with respect to risk factors

Risk factors	Sex				Total	
	Female		Male			
	N	%	N	%	N	%
Past history of similar Complaints	0	0.0	3	6.0	3	6.0
Hypertension (HTN)	10	20.0	27	54.0	38	76.0
Diabetes Mellitus (DM)	4	8.0	5	10.0	9	18.0
HTN with DM	2	4.0	5	10.0	7	14.0
Presence of IHD	1	2.0	2	4.0	3	6.0
Anticoagulation	1	2.0	2	4.0	3	6.0
Smoking	0	0.0	15	30.0	15	30.0
Alcohol	0	0.0	19	38.0	19	38.0
Drug Abuse	0	0	0	00	0	0
Chi-square Test	14.265**					
P-value	0.047					
Significant	YES					

Table -2 Shows that the Risk factors of patients. Out of 50 cases, 38(76%) patients had HTN and 9(18%) of them have diabetes mellitus (DM) only, both HTN and DM were present in 7(14%) of patients. Similarly, Smoking and Alcohol consumption were present in the order of 15(30%) and 19(38%) respectively. Also, patients with past history of similar complaints , history of IHD and on Anticoagulation therapy were are 3(6%) each .**Chi-square test = 14.265 , P= 0.047 , significant at 5% level.

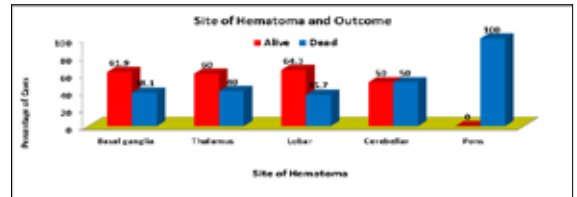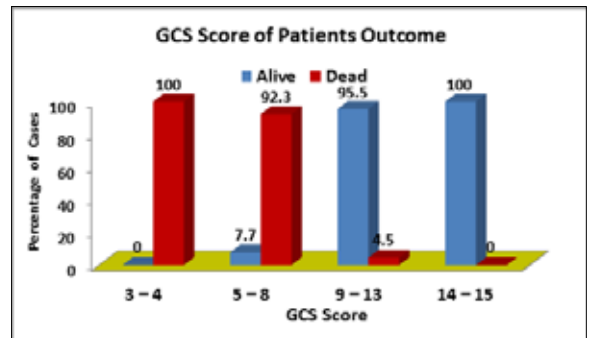**Figure 2 : Site of Hematoma and outcome**

Figure 2 : Shows Pontine hemorrhage was associated with the highest mortality of 100%, with 50% Mortality in patients with cerebellar hematoma ,the Basal Ganglia ,Thalamus and the Lobar Hemorrhages have 38.1%,40% , 35.7% mortality respectively.

Figure – 3. GCS of Patients
The mortality was 100% in patients who had GCS score 3-4, 92.33% in patients who had GCS score 5-8, and 4.5 % in patients who had GCS score 9-13. No mortality was found in patients who had GCS score 14-15. Thus, low GCS score was found to be a good indicator of worst prognosis. The overall Mortality in thus study group was 21(42%).

Table 3: Hypertension and outcome

Blood Pressure	Total Cases	Alive		Dead	
		Number	%	Number	%
Systolic BP in mmHg>180	24	11	45.83	13	54.16
< 180	26	18	69.23	8	30.76
CC=.314;P<.037(S)					
Diastolic BP in mmHg >110	27	11	40.74	16	59.25
< 110	23	16	69.56	7	30.43
CC=.328;P<.028(S)					

Table 3: The mortality was (54.16%) among patients who had systolic B.P > 180 mmHg compared to those who had systolic BP <180 mmHg (30.76%) The mortality was up-to two times (59.25%) among patients who had diastolic BP>110 mmHg compared to those who had diastolic B<110 mmHg (30.43%). When contingency coefficient test was applied to these data a significant association was observed indicating that higher the SBP and DBP higher was the mortality.

In our study mean serum cholesterol was 186.18 mg/dl. There is evidence of other target organ damage with 15(30%) of patients having Microalbuminuria, 11(22%) with elevated

blood urea, 8(16%) patients with elevated serum Creatinine. Fundus examination revealed normal fundus picture in 16 cases (32%). Grade I hypertensive Retinopathy in 13 (26%), Grade II retinopathy in 9 (18%) cases, Grade III retinopathy was seen in 5 (10%) cases and the fundus was not visualised due to cataract in 5 (10%) cases out of 50. Only two patients were found to have papilloedema.

DISCUSSION:

Among the 50 cases of hemorrhagic stroke studied, the incidence of intracerebral haemorrhage increased as the age advanced. In our study up to 75% of hemorrhagic stroke occurred in the age group of more than 50 years. It is comparable to other studies. In Kumaravelu et al.,[7] 64% of the cases were of age more than 50 years. In Qureshi et al.,[8] 85% of the cases were of age more than 50 years. The mean age in our study was 56.62 years it is comparable with Qureshi et al.,[8] at 56.4, Daverat et al [9] at 61 years. In our study 37(74%) were males and 13(26%) females. Males outnumbered females but not statistically significant.

The most common risk factor in our study was hypertension (76%), followed by alcohol consumption (38%) and smoking (30%).It is comparable with Qureshi et al.[8] and Calandre et al.[10] The other risk factors we found in our study were diabetes mellitus (18%), anticoagulant therapy (6%), IHD (6%). Also in Archana et al.[11] the major risk factors they found were hypertension followed by alcohol consumption and smoking.

Among hypertensives 30(60%) were on irregular treatment and 8(16%) were taking regular treatment. Among hypertensives irregular treatment / non-compliance was a major problem found in our study. This is comparable to similar study done by Qureshi et al.[8]

In our study mean serum cholesterol was 186.18 mg/dl. Konishi et al.[12] in his study had found an association between low serum cholesterol (< 160 mg/dl) and ICH in Japan population. The difference between Konishi et al.[12] and the present study is probably due to the difference in race and food habits.

The GCS score is inversely proportional to the mortality. In our study the patients who had GCS score of 3-4 had mortality of 100% which is comparable with Portenoy et al.[13]

In our study, the basal ganglionic haematoma constituted 21(42%) followed by thalamic (20%), lobar (28%), cerebellar (4%) and pontine (6%) of cases, which is comparable to Hemphill et al.[14]

In our study, as the volume of haematoma increased, the mortality increased and is statistically significant. There is a direct significant relationship with volume of haematoma and outcome.

In our study, 78.57% of patients with volume of haematoma > 30 cm^3 had poor outcome It is comparable to Qureshi et al.[8]

Midline shift was present in 71.42%.and the presence of intraventricular extension of haemorrhage indicates poor prognosis and is statistically significant. Comparable to Daverat et al.[9]

It is evident in our study that patients who had systolic BP > 180 mm Hg and diastolic BP > 110 mm Hg had mortality of 54.16% and 59.25% respectively. So the initial blood pressure plays a major role in the outcome. Both increase in systolic and diastolic blood pressure had poor prognostic outcome. Data is comparable to Kumaravelu et al.[7]

CONCLUSION:

Hemorrhagic stroke has remained a serious disease despite recent improvements in management. So efforts must be directed towards better understanding and modification of risk factors.

The major risk factor in our study was hypertension. The other common risk factors were alcohol consumption and smoking. Thus, measures to ensure adequate control of hypertension, abstinence from alcohol and smoking may reduce the incidence of Stroke.

Old age, low GCS score, high SBP, high DBP, volume of hematoma more than 30 cc, site of hematoma in pons, midline shift, intraventricular extension are associated with an increased mortality that would indicate bad prognosis .

In addition to diagnosis of ICH, CT Scan can also be used as an useful tool in assessing prognostic outcome of ICH.

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