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An observational study on clinical profile and outcome among patients diagnosed with haemorrhagic stroke in a tertiary care centre, Telangana state

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Abstract
Introduction: Sudden onset of a neurologic deficit that is attributable to a focal vascular cause is defined as Stroke. Stroke is the second leading cause of death worldwide and one of the leading causes of disability.
Methodology: A Prospective study including patients attending outpatient department and inpatients of medicine were included in the study. The study was carried out in RVM Hospital, Siddipet district, Telangana state over a period of one year from July 2019 to July 2020.With sample size of 50 patients.
Results: In this study among 50 cases, 27 are males (54%) and 23 are females (46%). The mean age is 54.64+12.78 (SD).It was observed that males suffered ICH at younger age compared to females with P-value of 0.041. Basal ganglion is the commonest site involved (32%), followed by lobar (30%), thalamus (16%), cerebellum (12%) and brainstem (10%).
Conclusion: Hypertension is found to be the major risk factor for stroke and Low GCS score, large volume of hematoma and midline shift are found to be strong predictors of poor prognosis in ICH patients.

Keywords: Stroke, Intra cranial Haemorrhage (ICH), Hypertension, Glasgow coma scale (GCS)

Introduction

Sudden onset of a neurologic deficit that is attributable to a focal vascular cause is defined as Stroke. Stroke is the second leading cause of death worldwide and one of the leading causes of disability. Strokes are classified into two i.e., ischemic or haemorrhagic. Intra cerebral haemorrhage (ICH) is caused by bleeding directly into the brain parenchyma producing neurologic symptoms by a mass effect on neural structures or from the toxic effects of blood itself or by increasing intracranial pressure (ICP). ICH is the second most common subtype of stroke after ischemic stroke and accounts for approximately 10 to 15 % of all strokes. The commonest cause of ICH is the rupture of an atheromatous artery in case of hypertensives. The most common sites of a cerebral haemorrhage are the putamen and internal capsule. Neurological deficits are usually sudden and progressive over 10-30 minutes. In India, data from major cities indicated an Annual Incidence Rate of stroke as 123 in Kolkata [1], 148 in Mumbai [2] and 135 in Trivandrum [3] per 100,000 per year. The Annual Incidence Rate of stroke in India, as observed above are higher than that in United States (145-154 per 100,000 per year) [4] and European countries 61-111 per 100,000 per year) [5-7]. Van Asch *et al*., who derived their figures from a meta-analysis in 2010 concluded that the overall incidence of ICH was 24.6 per 100000 person-years [8]. Among all studies included in that meta-analysis the incidence of ICH in Asian populations has been found to be 51.8 per 100,000 person-years, which is two-fold higher than that in other ethnicities. According to the recent World Health Organisation statistical profile, stroke has been one of the leading causes of death in India over the past decade, of which ICH accounts for the majority. The major reason is that the common risk factors of stroke are not being adequately controlled. In India, 30 to 50% estimate of early mortality in the ICH patients despite getting appropriate treatment. Hence the objectives of this study are 1.To study the clinical profile and to identify the various risk factors and etiological factors in patients with haemorrhagic stroke as well as the factors which determine the clinical outcome among patients with haemorrhagic stroke.

Methodology

A Prospective observational study including patients attending outpatient department and inpatients of medicine were included in the study. The study was carried out in RVM Hospital, Siddipet district, Telangana state over a period of one year from July 2019 to July 2020. With sample size of 50 patients. Inclusion criteria: 1. Patients diagnosed as acute haemorrhagic stroke 2. Age between 20 and 80 years. Exclusion criteria: 1) Patients with traumatic haemorrhage of brain 2. Those who are not willing to give consent. Prior to the study, approval was obtained from the Institutional Ethical Committee. Patients or the attendants were approached during the hospitalization to obtain informed and written consent. Patients or the attendants were interviewed to obtain information on the onset of stroke and any pre-existing risk factors like hypertension, diabetes mellitus, previous history of stroke and any use of medications. Statistical analysis: Patient demographics and clinical characteristics were represented as mean ± standard deviation (SD) for continuous data, and frequency counts and percentages for categorical data variables are compared using a t-test in the case of continuous variables and a chi-square test for categorical variables. Statistical significance was considered if P <0.05.

Results

In this study 50 cases were observed, out of that 27 are males (54%) and 23 are females (46%). Overall mean age is 54.64+12.78 (SD). Males suffered ICH at younger age compared to females 51.92+11.96 (SD) vs. 55.92+12.79 (SD) with P-value of 0.041.

Table 1: Showing the site of haemorrhage among the study cases

Site	Number of Patients N=50 (%)
Basal Ganglia	(32)
Thalamus	(16)
Lobar	(30)
Cerebellum	(12)
Brain stem	(10)
Total	100

Basal ganglion is the commonest site involved (32%), followed by lobar (30%), thalamus (16%), cerebellum (12%), brainstem (10%).

Basal ganglionic bleed is the commonest in both sexes. Deep hematomas are slightly more common in men (66.3% of total ICH in men versus 62.6% of total ICH in women with a P-value of 0.773). Lobar hematomas are slightly more common in men but this difference is also not significant with a P-value of 0.778.

Table 2: Showing etiological factors responsible for IHD

Etiology	Number of Patients
Hypertension	35
A V Malformation	6
Tumors	4
Unidentified	5
Total	50

35 out of 50 patients (70%) are having hypertension, 6 patients (12%) had bleeding related to arteriovenous malformation and 4 patients (8%) with tumour related bleeding and among 5 (10%) patients the cause was unidentified.

Table 3: Showing aetiology of haemorrhage versus gender

Etiology	Male	Female	Total
Hypertension	19	16	35
Arteriovenous Malformation	4	2	6
Tumors	1	3	4
Unidentified	3	2	5

In both men and women hypertension is the major risk factor. 70.37% of male patients and 69.56% of the female patients are having hypertension.

Table 4: Showing aetiology and site of haemorrhage

Etiology	Basal Ganglia	Thalamus		Cerebellum	Brainstem
Hypertension	14	8	11	1	1
Arteriovenous Malformation	0	0	2	2	2
Tumor Related	0	0	1	2	1
Unidentified	2	0	1	1	1

Majority of hypertensive had bleeds in the basal ganglionic region 14 cases, followed by lobar 11 cases and thalamic region 8 cases.

Table 5: Showing site of haemorrhage versus mortality

Site	Dead	Alive	Total
Basal Ganglia	6	10	16
Thalamus	6	2	8
Lobar	4	11	15
Cerebellum	2	4	6
Brainstem	2	3	5
Total	20	30	50

Maximum mortality rate 6 out of 8 (75%) is seen in thalamic region. Chi square test, when applied to find out the association between the site of haemorrhage and outcome, the result is not statistically significant with a P-value of 0.133.

Table 6: Glasgow coma scale versus mortality

GCS	Outcome		
	Dead	Alive	Total
≤ 7	16	0	16
8 – 11	4	18	22
≥12	0	12	12
Total	20	30	50

All the 16 patients with GCS < 7 died.18 survived and 4 expired out of 22 patients with GCS level in between 8-11 followed by 12 patients with GCS > 12 survived. Mean GCS + SD for patients who survived is 16.08+4.10 and 11.14+3.88 for patients who died. Result is statistically significant with a P-value of < 0.0441.

Table 7: Showing Ct characteristics versus Mortality

CT characteristics	Yes / No	Dead	Alive	Total
Intraventricular Extension	Yes	9	15	24
	No	9	17	26
Midline Shift	Yes	11	16	27
	No	8	15	23

In this study, 9 out of 24 patients with Intraventricular Extension and 11 out of 27 patients with Midline shift died. Chi square test is applied to find out the association between CT characteristics and outcome, the result is not significant with IVE (P=0.149) and significant with MLS (P=0.0046)

Discussion

In this study overall mean age is 54.64+12.78 (SD) the results are similar and comparable with studies conducted by Rathor MY *et al* [9] and Qureshi A *et al* [10]. Other studies by Sacco S *et al* [11] and Godoy D *et al* [12] showed a higher mean age of incidence. Male preponderance of 27 cases (54%) is comparable with majority of the previous studies which showed a higher proportion of male patients. However one study conducted by Sacco S *et al* [11] showed female preponderance (55%). Basal ganglionic region (40%) is the commonest site of ICH followed by lobar (32%) and thalamus (24%). In this study, proportion of deep ICH (66.3%) is the highest, which is comparable with other studies conducted by Izumo city, Japan [13] (69%), Dijon, France [14] (67%). In this study hypertension is the commonest risk factor constituting 70% of patients. Almost all the studies on ICH agree that systemic hypertension is the single most common risk factor. Two in-hospital based studies, one from Malaysia by Sia SF *et al* [15] and another from Iran by Togha M *et al* [16] observed similar results with hypertension being the most common risk factor (84.8% and 65% respectively). In a meta-analysis of 11 case control studies by Ariesen M.J *et al* [17], all studies showed a positive association between hypertension and the risk of ICH. The overall odds ratio was 3.7. Majority of the hypertensive bleeds are in the basal ganglion (32%). Arterial hypertension is more common in (88.23%) than in lobar haemorrhages (75%), but not as much as 2-fold more common in the former than in the latter as reported in a recent review by Jackson CA *et al* [18]. Results of this study showed a slightly higher mean GCS score for male patients compared to females. This is comparable with similar results from studies conducted by Hsieh J *et al* [19] and Zahuranec D *et al* [20]. In this study, the mortality rate is very high in thalamic region (75%) compared to other regions but it showed statistically in-significant. A recent study by Wang C *et al* [21] done to understand the mortality predictors in ICH showed similar results as ours without any statistically significant association between outcome and location of bleed. In our study, patients with a GCS score < 7 have significantly high mortality (100%) and the patients with GCS score > 12 had no deaths, the results showed a strong correlation between GCS at admission and patient mortality (P value < 0.0441). Other studies by Sia Sf *et al* [15] and Ahmed R *et al* [22] also showed that admitting GCS has a strong statistical association with mortality. Based on this results and previous studies conducted, GCS could serve as an independent prognostic factor for poor outcome and may help clinicians to assess prognosis more accurately. Mean CT Hematoma volume was found to be a statistically significant predictor of mortality (P value <0.0012) which is Similar to the observations reported by Wang C *et al* [21] where mean CT volume is an important predictor of ICH mortality (P value 0.009).

Conclusion

Age related increase in the proportion of patients (70% patients in > 40 years age group) is observed. Male patients are predominantly affected and males suffered ICH at a significantly younger age compared to females. Basal Ganglion is the commonest site involved in both sexes. Hypertension is found to be the major risk factor. Low GCS score, large volume of hematoma and midline shift are found to be strong predictors of poor prognosis in ICH patients. CT scan is of good value in diagnosis and estimation of prognosis of ICH.

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