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STUDY OF SPONTANEOUS INTRACEREBRAL HAEMORRHAGE IN AN INDUSTRIAL POPULATION

Anaesthesiology

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KEYWORDS

INTRODUCTION

Spontaneous intracerebral haemorrhage (SICH), a devastating form of cerebrovascular accident, is defined as bleeding into brain parenchyma without preceding trauma. It may be primary as in case of hypertension or secondary due to various congenital or acquired conditions.[1] It accounts for 10%-30% of all stroke admissions to hospital, and leads to catastrophic disability, morbidity and a 6 month mortality of 30 %-50%. Long term outcome are also poor[2] The world wide incidence of spontaneous intracerebral haemorrhage is between 11% and 15% of all strokes. In India this figure ranges from 8% to 15% in different studies[3,4]

Hypertension has been regarded as the most prevalent and powerful risk factor for intracerebral haemorrhage (ICH). The mechanism involves a hypertension-induced degeneration of the walls of small arteries (lipohyalinosis) that leaves them prone to rupture. Hypertensive intracerebral haemorrhage typically occurs in the basal ganglia (putamen, thalamus or caudate nucleus), pons, cerebellum or deep hemispheric white matter[5]

Though the last few decades have seen lesser mortality and morbidity, outcome is still determined by the severity of bleed and overall mortality is approximately 40-50%. Hence identification of modifiable risk factors for ICH is important to influence the incidence .[6]

With advent of better management in the form of antihypertensives, vigorous pulmonary care, prevention and treatment of hydrocephalous, maintenance of fluid and electrolyte balance, surgical intervention whenever needed, the outlook for patients has improved over the decades[7]

We conducted a study on 50 patients in our institution to determine the clinical presentation, localization of hypertensive intracerebral hemorrhage and finally assessed the prognosis and mortality in hypertensive intracerebral hemorrhage using a clinical grading scale namely ICH score.

MATERIALS AND METHODS

The present observational study was conducted in our institution over a period of two years. 50 patients were enrolled in this study.The patients who were admitted in emergency department with hypertensive intracerebral haemorrhage were considered for the study.They were diagnosed by clinical examination and CT scan and further included in the study. Patients with head injury, primary or secondary brain tumours, aneurysms, arterivenous malformations, cortical vein thrombosis or on anticoagulation therapy were excluded from the study.

A detailed history was obtained either from patients or close relatives with special reference to presenting symptoms such as headache, vomiting, giddiness and fall, paresis, seizures and altered sensorium and significant past history, if any, of diabetes or hypertension. If patient was a known hypertensive, history regarding treatment was noted.

Associated neurological examination was done in all patients. Level of consciousness at time of admission was assessed by Glasgow Coma Scale(GCS). Examination for cranial nerve deficit and detailed motor examination was carried out.

Complete blood investigations along with chest Xray and ECG were also done. CT scans were thoroughly evaluated for locations, volume of hematoma, intraventricular extension, mass effect and hydrocephalous.

Depending on clinical conditions and size of hematoma, patients were subjected either to-medical or surgical management. Patients having volume of hematoma less than 40cc and GCS more than 10 at time of admission were subjected to conservative management. Patients having volume of hematoma more than 40cc and GCS less than 10 at time of admission were subjected to surgical management. Patients having poor G.C.S at admission and intraventricular extension with developing hydrocephalus were treated with external ventricular drainage.

In the medical group, patients were treated with antiedema and antihypertensive measures with other supportive care as and when required.In the surgically treated group open craniotomy with corticotomy and evacuation of hematoma was done. In all patients, medications to control the blood pressure, vigorous nursing care and proper physiotherapy were given during their stay in hospital.

The outcome of patients who were discharged was graded according to activity of daily living score (ADL) as suggested by Matsumoto and Hando[8]

ADL1- Return to full work.
ADL2- Minimal disability. (Self sufficient)
ADL3- Partial disability. (Partial self sufficient)
ADL4- Total disability. (Bed ridden)
ADL5- Vegetative.
Died.

This score was divided as Favourable outcome (ADL1.2&3) and unfavourable (ADL4&5). The overall outcome was compared with initial G.C.S. The outcome of medically treated group (n=15) and those treated with surgery (n=15) and E.V.D. (n=20) were compared with their initial G.C.S. We had also compared the outcome of surgically and medically treated patients with respect to volume of hematoma. All the data were observed and presented in percentage forms.

RESULTS

A total of 50 cases of hypertensive intracerebral hematomas were studied. The following observations were made.The maximum incidence was observed in 6th Decade. [28%] .In this series out of 50 patients, 35 were male and 15 were female patients. Male to female ratio was 2.3:1.

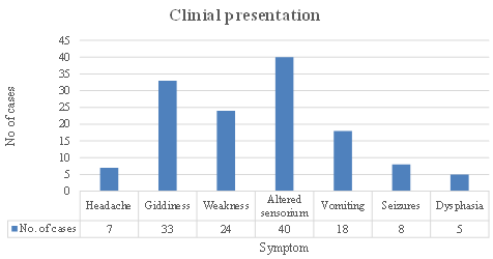
Clinical presentation:

Out of 50 cases, at the time of admission 80% cases presented with altered sensorium, followed by 66% of giddiness, 48% with weakness, 36% presented with vomiting and the less common presenting features were headache, seizures and dysphasia. All the symptoms were acute in onset. Ref. Bar diagram 1

Out of 50 patients, 58% patients were detected having hypertension at the time of admission and 42% patients were known hypertensive, out of which 62% patients were taking regular treatment, and 38% patients were taking irregular treatment.

Percentage of patients admitted according to the severity of Glasgow

Coma Scale



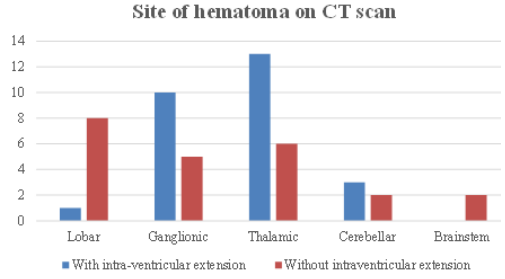
Bar diagram 1-Patient distribution according to clinical presentation

Table 1- showing Glasgow coma score at admission (n=50) Patients having G.C.S. less than 10 were 32 (64%) and patients having G.C.S. more than 10 were 18 (36%).

G.C.S.	No. of patients	Percentage
3	2	4%
4	3	6%.
5	4	8%
6	6	12%
7	5	10%
8	4	8%
9	6	12%
10	2	4%
11	4	8%
12	1	2%
13	2	4%
14	6	12%
15	5	10%
Total	50	100%

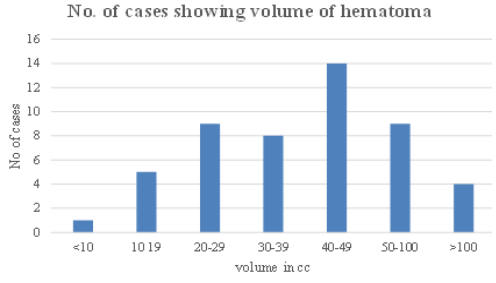
SITE OF HEMATOMA:
The maximum incidence of hematoma was present in thalamic region 19 cases.

The distribution is depicted below in bar diagram 2



Bar diagram 2-site of haematoma in CT Scan

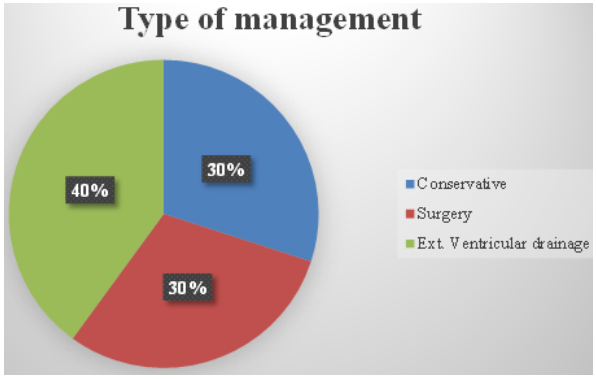
VOLUME OF HEMATOMA:
The volume of hematoma was determined with help of ABC/2 formula at the time of admission. These parameters were used to determine the mode of management and to determine outcome.It was observed that 15 patients were present in range of 10-19cc and 20-29cc. 1 patients were presented in range less than 10cc 1 patient had hematoma of 200Cc.Total number of patients having volume of hematoma less than 40cc were 23(46%) and volume more than 40cc was seen in 27 cases(54%). (bar diagram 3)



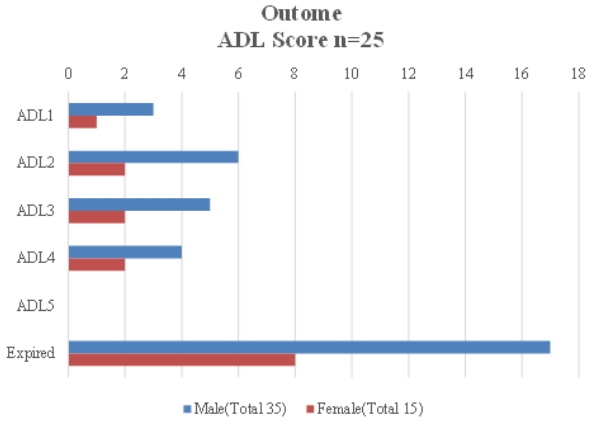
Bar diagram 3-number of cases showing volume of hematoma

TYPE OF MANAGEMENT
The percentage of patients receiving different management was identical. Conservatively treated patients (n=15) received antihypertensive and antiedema measures. Patients subjected to surgery (n=15) underwent open craniotomy with evacuation of hematoma and decompression. Patients (n=20) treated with external ventricular drainage (E.V.D) were having intraventricular extension of hematoma in 17 cases and 3 cases had hydrocephalous. (pie chart1)

Chart1: Type of Management



OUTCOME:
Out of 50 patients, 50% patients were discharged with varying degree of neurological deficit, favorable outcome (ADL1,2,3) was seen in 19 cases (76.%), unfavorable outcome was seen in 6 cases (24%) 2 5 patients expired.(bar diagram 4)
Favorable outcome ADL 1, 2, 3; Unfavorable outcome ADL 4



Bar diagram 4-Outome

OUTCOME ACCORDING TO INITIAL GCS.:
The mortality was high among the patients with low GCS at admission. Patients having GCS less than 10 (n=32) had mortality in 21 cases (65.62%), 5 patients (15.6%) showed favorable outcome and 6 patients (18.7%) showed unfavorable outcome.

Out of 18 Patients having GCS more than 10, 14 patients showed favorable outcome (77.7%) and 4 patients expired (22.2%) Ref. Table no. 2

Table2: Outcome according to G.C.S. (n=50)

GCS	No.	ADL1	ADL2	ADL3	ADL4	ADL5	Expired
3-6	2	0	0	0	2	0	13
7-10	9	0	1	4	4	0	8
11-15	14	4	7	3	0	0	4
Total	25	4	8	7	6	0	25

Favorable outcome ADL 1, 2, 3, Unfavourable outcome ADL 4, 5

OUTCOME ACCORDING TO SITE OF HEMATOMA IN MEDICAL MANAGEMENT
Out of 50 cases, 3 patients (20%) of lobar hematoma were treated with medical management out of which 2(66%) showed favorable outcome 1 patients (33%) expired. Out of 4 (27. %) patients in thalamic group

3(75.5%) showed favorable outcome, 1 patient (25%) had expired. Out of 5 patients (33.4%) in ganglionic hematomas 2 patients (40%) had favorable outcome and 1 patients' unfavourable outcome (20%) and 2 patients (40 %) expired. All 2 patients (13%) of cerebellar hematoma showed favorable outcome. 1 patient of brainstem hematoma (6.6%) expired. (table 3)

Table3: Profile of outcome according to site of hematoma in medically treated patients. (n=15)

Site	ADL Score				Expired	Total
	ADL1	ADL2	ADL3	ADL4		
Lobar	0	2	0	0	1	3 (20.0%)
Thalamic	1	1	1		1	4 (26.7%)
Ganglionic	0	1	1	1	2	5 (33.4%)
cerebellar	1	1	0	0	0	2 (13.0%)
Brain stem	0		0	0	1	1 (6.6%)
Total	**2**	**5**	**2**	**1**	**5**	**15(100%)**

DISCUSSION

Spontaneous intracerebral hematoma has a worldwide incidence of around 11% - 15% of all stroke[9]. In spite of all extensive research regarding its management over the past century, the mortality rate still remains unacceptably high(over 50% [7]) and more than 75% of the survivors are left with deficit to a lesser or greater extent.[10]

We therefore conducted this study to determine the various aspects of SICH in our institution.In our study, it was observed that maximum number of patients was aged between 40 and 69 years which were similar with other studies worldwide. This age distribution suggests high incidence of hypertension & atherosclerosis prevalent in this age group. There was a male predominance in the occurrence of SICH in our case with a male female ratio of 2.3:1.

SICH shares a number of clinical presentations that resulted from progressive accumulation of blood in brain parenchyma. In our study 80% patients presented with altered sensorium, 66% with giddiness and weakness were observed in 48%. Vomiting was present in 36% cases. All the patients had an acute onset of neurological symptoms. Compared to Anderson's series in which motor deficit (87%) was the most common presenting symptom, in our series it was 48%.We had patients with altered sensorium (80%)as the most common presenting symptom. Giddiness was found in 66% cases in contrast to Anderson et al (12%). Headache & seizures were not common in both the series. The differences in symptoms could have been due to the different timing of admission, the initial GCS and the area of brain affected most. Dhamija et al[4]and Imelinski et al s studies showed 80% -87.8% patients had hypertension.[11] While Gambhir et al and Perth studies observed this incidence to be 55%[12] which were similar to our series.

We found that the incidence of patients having GCS more than 9 was 40%, and less than 9 as 60% which was contrary to Imilienski but similar to Seppo et al s study. This can be due to the inclusion criterion in our studies .Being a tertiary care center the cases in our scenario have had a late presentation in terms of GCS on admission.

In our study Lobar hematomas were seen in 18% cases, ganglionic hematomas in 30%, thalamic hematomas in 38%, Cerebellar in 10% and brain stem hematomas in 4% cases as shown in (Table no.). We have compared these findings with other studies done by Dhamija et al , and Kazui et al[2]and found more incidences of cerebellar hematomas and less of ainstem hematomas as compared to other studies.Two third of all Cerebellar hematomas are secondary to hypertension. Cerebellar hematomas has highs mortality mainly because of brainstem compression and tonsillar herniation caused by the hematoma, high incidence of intraventricular extension and compression of fourth ventricle leading to development of hydrocephalous.[7]

Volume of hematoma is a strong predictor for outcome of SICH. In our series we have used the formula ABC/2, which is derived by Kothari et al.(39) We have observed that maximum number of patients(37 patients) presented in the range 10 and 49cc of intracerebral blood. Stephan A Mayer et al reported that among non comatose patients, large hematoma volume on initial C.T along with progressive oedema is highly associated with subsequent clinical deterioration(78% of patients) . The presence of intraventricular extension (I.V.E.) is also considered as poor prognostic sign which lead to high mortality rates. In our series associated intraventricular extension was found in 46% of cases.

Out of 50 cases in our series 30% patients received medical management, which included antiedema, anticonvulsants and antihypertensive measures, with other supportive care as required like ventilatory support.30% cases underwent surgical intervention which included craniotomy with corticotomy and evacuation of hematoma for decompression.Surgery was considered in cases of progressive neurological deficit ,functional impairment lasting longer than week and development of intracranial hypertension. 40% cases underwent external ventricular drainage(E.V.D.)which mainly included hemorrhages with intraventricular extensions and hydrocephalous. Waga and Yamamota showed that the results of the treatment of ICH did not depend upon the surgical treatment, but on the site and extent of original hematoma.[14]

In the present study patients outcome was graded according to ADL Score[8] Total mortality was 50%. Favorable outcome (ADL1.2&3) was seen in 19(76%) cases. Unfavorable outcome (ADL 4 & 5) was seen in 6 (24%) cases.In our study we have observed that level of consciousness, size of hematoma and ventricular extension are the most important predictors of outcome. F. John and Giilinham concluded that, patients with massive hematomas or with intraventricular extension should be left alone because of high mortality irrespective of mode of treatment. R.Lorenz[15] et al found that young patients, with longer duration of symptoms, preserved consciousness level, with a clot in the subcortical area if treated surgically, had better prognosis.

In present study out of conservatively treated patients 6.6% showed unfavorable outcome and 33.3% was the mortality rate, where as in surgically managed patients favorable outcome was seen in 33.3%, unfavorable outcome was seen in 20% and 46.6.% was the mortality. The higher mortality and unfavorable outcome in surgically treated patients in our series can be contributed to the fact that the most of the patients in this group had low G.C.S and larger hematoma on admission than those treated conservatively.

CONCLUSION

A detailed outcome analysis was performed on 50 cases of hypertensive intracerebral hematomas treated at our institute . 32 patients (64%).were presented with GCS less than 10 and 18 patients (36%) were presented with GCS more than 10 at the time of admission.Most frequent site of hematomas was Thalamic (38%) followed by Ganglionic (30%), Lobar (18%), cerebellar (10%) and Brainstem (4%).

15 cases were treated with medical management (30%), 15 cases were treated with surgical management (30%) and 20 cases were treated with external ventricular drainage (40%).In spite of improved diagnostic aids, management of hypertension, operative facilities like operating microscope, intensive care units the morbidity and mortality still remained high(50%).

Favorable outcome (ADL1, 2&3) was seen in 38% cases and unfavorable outcome (ADL4& %) was observed in 24% cases. The higher mortality was seen in surgically treated patients.The mortality and morbidity also depended on size and ventricular extension of hematoma. Cases with intraventricular extension and hematoma volume more than 40 cc showed higher mortality both in surgically and conservatively treated patients.

In cases of supratentorial SICH, patients having initial G.C.S. between 11 and 15 with no signs of raised intracranial pressure and hematoma volume less than 40cc should be treated with complete bed rest, medications to lower the blood pressure and dehydration. In patients with deteriorating consciousness, signs of raised intracranial pressure and herniation, surgery is indicated.

In cases of cerebellar hematomas, patients with better clinical condition (G.C.S.14 & 15) at the time of admission and having hematoma less than 30cc should be treated conservatively. Patients with poor to moderate clinical condition (G.C.S. less than 13) at the time of admission and /or having hematoma more than 30cc should be treated surgically as early as possible.

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