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Sunt FOR RESEARCE	Original Research Paper	Neurosurgery	
Mernational	A PROSPECTIVE STUDY TO ASSESS THE MORTALITY OUTCOME IN HYPERTENSIVE INTRACEREBRAL HI SURGICALLY TREATED PATIENTS.	AND FUNCTIONAL MORRHAGE IN	
Dr. Rishi Kumar	Ex Resident, Department of Neurosurgery, G R Medica	College Gwalior MP.	
Dr. Aditya Shrivastava*	Associate Professor, Department of Neurosurgery, Gwalior MP. *Corresponding Author	G R Medical College	
Dr. Avinash Sharma	Professor, Department of Neurosurgery, GR Medical	College Gwalior MP.	
Dr. Ashish Mathur	Associate Professor, Department of Anaesthesiology Neuroanaesthesia, GR Medical College Gwalior MP.		
ABSTRACT AIMS AND OBJECTIVES Study the mortality and Functional outcome in hypertensive intr hemorrhage in surgically treated group. MATERIAL AND METHOD :we take 30 patients with Ex- spontaneous lobar ICH and large basal ganglia hemorrhage on CT scan. Early evacuation of the haematoma by the			

spontaneous lobar ICH and large basal ganglia hemorrhage on CT scan. Early evacuation of the haematoma by the method preferred by the treating neurosurgeon, usually craniotomy or craniectomy Performed. Further information about the post operative progress were collected. **RESULT & CONCLUSION**: In Selective Group of patients in our study had high mortality and poor functional outcome. Functional outcome was improve in survived patient in our study after 6 months follow up.

KEYWORDS : intercerebral hemorrhage , craniotomy , ICH

INTRODUCTION:

Primary Intracerebral hemorrhage (ICH), i.e. spontaneous extravasation of blood into the brain parenchyma.¹After the onset, bleeding may continue and the hematoma grow for several hours, leading to progressive clinical deterioration of the patient's condition. Computed tomography (CT) soon after the onset of symptoms is crucial for the diagnosis. Urgent emergency procedures and intensive care are often needed.

Primary Intracerebral hemorrhage (ICH) accounts for 10 to 40% of all cases of stroke. ¹The role of operative neurosurgical intervention is controversial. Within the spectrum of ICH there are some patients (with large or space occupying ICH) who require surgery for neurological deterioration and others with small haematomas who should be managed conservatively.²

The present study is designed to find out effectiveness of surgical intervention in selected group of patient on the basis of GCS score and volume of hemorrhage.

MATERIAL AND METHODS:

It is a prospective study, conducted during December 2018 to August 2020 in Department of Neurosurgery, J.A. Group of Hospital and G. R. Medical College, Gwalior (M.P).

we take 30 patients with Evidence of spontaneous lobar ICH and large basal ganglia hemorrhage on CT scan. Early evacuation of the haematoma by the method preferred by the treating neurosurgeon, usually craniotomy or craniectomy Performed. Further information about the post operative progress were collected.

INCLUSION CRITERIA

- Evidence of spontaneous lobar ICH and large basal ganglia hemorrhage on CT scan.
- Patients between 25 to 65 yrs of age.
- Large volume of hematoma > 30 ml causing mass effect.
- Glasgow coma score >5.

EXCLUSION CRITERIA

Intracerebral hemorrhage caused by a brain tumor, aneurysm, vascular malformation, hematological malignancy, coagulation disorder, or head trauma.

METHODS

The onset of ICH is typically followed by a rapid decline of consciousness and progression of neurological symptoms. All

patients who were considered for study on tha basis of inclusion and exclusion criteria had CT scan with intracerebral hematoma. In the non-contrast computed tomographic (NCCT) scan of the head, the hematoma volume, midline shift, location (deep or superficial), and intraventricular extension were noted. Written witnessed informed consent of patients relative wereobtained. Early evacuation of the hematoma by the method preferred by the treating neurosurgeon, usually craniotomy or craniectomy Performed. Further information about the post operative progress were collected. patients also had an postoperative CT scan at about five days to assess the residual and Recurrent Hematoma, surrounding edema ,hydrocephalus or any other changes. In Post operative period standard medical therapy included maintaining the airway by placing a nasopharyngeal tube, an endotracheal intubation, or a tracheostomy as and when required, O2 by mask or ventilator support, head end elevation by 30°, hydration with inputoutput charting, control of blood pressure, reduction of intracranial pressure (ICP) using mannitol and furosemide, prophylactic antiepileptic therapy to prevent seizures, prophylactic antibiotics, appropriate feeding, physiotherapy, and management of any associated morbidity, if present. All the patients were kept in the intensive care unit (ICU) with close monitoring of vital parameters .Favourable and unfavourable outcomes were assessed at 6 month follow up. Patients were categorized on the basis of Glasgow outcome scale as having a favourable outcome GOS 4 or 5 and unfavourable outcome GOS 1 to 3. Patients data were filled in the master chart and analysed via statistical method.

RESULT AND ANALYSIS:

30 patients were included from our institute. Surgical intervention was done on the basis of radiological and clinical finding.

Following observation were noted:

Table 1 : Age Distribution and outcome

Age in	No of	Poor Outcome	Good outcome	P Value
years	patients	GOS 3 or <3	GOS >3	
25-45	10(33%)	6(60%)	4(40%)	0.127
46-65	20(67%)	17(85%)	3(15%)	
Total	30(100%)	23(76.66%)	7(23.33%)	

Most of patients in our study were above 45 yrs of age (67%). Good outcome was better in age group 25-45 yrs (40%) compare to 46-65 yrs (15%).

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Table 2 : Relation of Gender with Outcome

Gender	No of	Poor Outcome	Good Outcome	Р
	patients	(GOS 3 or < 3	GOS >3	Value
Male	20(67%)	17(85%)	3(15%)	0.127
Female	10(33%)	6(60%)	4(40%)	
Total	30(100%)	23(76.66%)	7(23.33%)	

In our study 67% were male and 33% female, so male female ratio was 2:1. Female had good outcome 4(40%) compare to male 3 (15%).

Table 3 : Side involvement and outcome

Side	No of	Poor Outcome	Good Outcome	Р
Involve	Patients	GOS 3 or <3	GOS >3	Value
Right	17(56.66%)	12(70.5%)	5(29.41%)	0.368
Left	13(43.33%)	11(84.61%)	2(15.38%)	
Total	30(100%)	23(76.66%)	7(23.33%)	

In our study,Right side involvement in 17(56.66%) and Left side involvement in 13(43%). Right side hematoma had good outcome in 5(29.41%) of cases compare to left side 2(15.38%).

Table 4: Co-morbidities other than hypertension

Co-morbidities	No. of Patients	Percentage
Diabetes Mellitus	02	6.66%
Dyslipedemia	11	36.66%
Chronic Renal failure	06	20%

In our study, most common co-morbidity was dyslipidemia.

Table 5 :NCCT Head Finding

CT Finding	No.of Patients	Percentage
Midline shift >5 mm	30	100%
Intra-ventricular extension	24	80%
Effaced ventricle	30	100%
Volume >50	20	67%
Hydrocephalus	12	40%

All patients had Effaced Ventricle and more than 5mm midline shift.

Table 6 : Midline shift in CT scan and outcome

Midline	No of	Poor Outcome	Good Outcome	Р
shift	Patients	GOS 3 or <3	GOS- >3	Value
<10mm	14(46.6%)	7(50%)	7(50%)	0.001
>10mm	16(53.33%)	16(100%)	0%	
Total	30(100%)	23(76.66%)	7(23.33%)	

Most of the patients were having more than >10mm midline shiftand had poor outcome (100%). 14 patient with <10mm midline shift had good outcome in 7 (50%) compare to >10mm shift (0%).

Table 7 : Location of Hematoma and outcome

Location of	No of	Poor	Good	Р
hematoma	patients	Outcome 3	Outcome	value
		or <3	GOS- >3	
Basal ganglia	22(73.33%)	19(86.36%)	3(13.63%)	0.269
Lobar hematoma	8(26.6%)	4(50%)	4(50%)	
Total	30(100%)	23(76.66%)	7(23.33%)	

In our study, Lobar hematoma had Good outcome 4(50%) compare to Basal ganglia hematoma 3(13.63%).

Table 8 : Type of Procedure and outcome

Type of	No of	Poor	Good	Р
Procedure	Patients	Outcome	outcome -	value
		GOS 3 or <3	GOS >3	
Craniotomy	20(66.66%)	16(80%)	4(20%)	0.542
Decompressive	10(33.33%)	7(70%)	3(30%)	
Craniectomy				
Total	30(100%)	23(76.66%)	7(23.33%)	

Craniotomy performed in 20(66.66%) and Decompressive craniectomyin 10(33.33%) of patients. Craniotomy and Decompressive craniectomy had almost similar outcome.

Table 9 :GC	CS αt the	time of	admission	and	outcome	

On admission GCS	No of Patients	Poor Outcome GOS 3 or <3	Good Outcome GOS->3	P Value
05-08	21(70%)	20(95.23)	1(4.76%)	0.001
09-12	08(26.66%)	3(37.5%)	5(62.5%)	1
13-15	1(3.33%)	0%	1(100%)	
Total	30	23(76.66%)	7(23.33%)	

Most of the patients in our study hadlow GCS (5-8), associated with poor outcome (95.23%). Patients with GCS 9-12 had good outcome in 5(62.5%).

Table 10:Outcome in relation to Volume of Hematoma

Volume of Hematoma (cc)	No of Patients	Poor Outcome GOS 3 or<3	Good Outcome GOS>3	P Value
30- 50 сс	10(33.33%)	4(40%)	6(60%)	0.001
51-70cc	15(50%)	14(93.33%)	1(6.66%)	
>70cc	5(16.66%)	5(100%)	0%	
Total	30	23(76.66%)	7(23.33%)	

Most of Patients in our study hadhematoma volume 51-70 cc, in which poor outcome was 93.33%. In patients with hematoma volume <50cc had good outcome (60%) compare to >50cc (6.66%).

Table 11: Post Operative Complications

Complications	No of Patients	Percentage
Respiratory Tract Infection	10	33%
Deranged Renal Function	15	50%
Urinary tract infection	8	27%
Ventilator associated Pneumonia	07	23%
Surgical site infection	04	13%
Septicemia	02	6%
Pressure Sore	06	20%6
Deep Vein Thrombosis	02	6%
Rebleed	02	6%

Most common complication were deranged renal function and respiratory tract infection.

Table 12:Mortality

Outcome	No of Patients	Percentage
Survived	10	33.33%
Expired	20	66.66%
Total	30	100

In our study Mortality was 66.66%.

DISCUSSION

Morbidity and mortality in spontaneous ICH was high as most previous study. Recent report have shown that the surgical methods which mainly includes craniotomy, catheter drainage, neuroendoscopy and neuro navigation assisted surgery for ICH are safe and effective. Craniotomy is a standard approach especially for hematoma volume more than 30 ml.³⁴.

Arterial hypertension is known as the most common risk factor for spontaneous intracerebral hemorrhag⁵⁶. In present study, however, hypertension was present in all patients in our study. Dyslipedemia was most common co-morbidity associated with ICH other than hypertension. Uncontrolled hypertension is the one of the cause of higher mortality rate in our study.

Primary ICH is considered to be a disease of the elderly, mean age of the study group in Hemphill etal.'s landmark paper was

66 years. mean age of patients in our study was 55, and as per age criteria in our study was upto 65 yrs of age, comparatively younger age of incidence has been reported uniformly across India and appears to be a characteristic feature of Indian subcontinent studies^{7.8.9.10}. Increasing age associated with increased morbidity and mortality, Patients above 45 years had poor outcome (80%). Patients below 45 yrs of age had good outcome(40%) compare to older age(15%)

Most of asian study men are commonly affected of ICH same like in our study male are affected more(67%) and poor outcome is higher in male patients. Female had good outcome (40%) compare to male(15%).. No statistical significant(P value-0.127) association between age and outcome in our study.

The value of CT scan measurements in prognostication with ICH is well known ¹¹. Volume of hematoma is one of the most important parameter to evaluate the severity of the condition . Volpin et al.¹² observed in all patients with a hematoma volume above 85 ml a lethal outcome. We also found statistical significant (P value 0.001) association of poor outcome with hematoma size. In our study, 10 patients had a pre-evacuation hematoma (30–50 ml), among them 6(60%) had a good outcome(GOS 4–5), while poor outcome in 4(40%). Out of the 15patients with large pre-evacuation hematoma (50–70), only 1 (7%) patients had a good outcome, while poor outcome in 14(93%). In extensive hematoma (> 70 ml), all patients had poor outcome 5 (100%).

In CT finding of Midline shift and ICH associated with poor outcome irrespective of location and volume of hematoma^{7,8,9}. In our study 16 patients had Midline shift >10 mm ,only one patient survive who had poor outcome , so Poor outcome in all patients (100%),

The most common location of spontaneous intracerebral haemorrhage is the Putamen, accounting for about 35% to 50% of the cases. In our study too, Basal ganglia is the commonest site of ICH, the incidence being 73.33% and differentiation between putamen and other not possible as volume is more so wide spread at the time of presentation. A biracial population study of 1,038 ICH cases showed that 49% were located deep in hemisphere, 35% Lobar¹³. In our study most common location of hematoma is basal ganglia (73.33%) followed by lobar hematoma(26.66%).

Craniotomy is a standard approach especially for hematoma volume greater than 30 ml. It can be performed with decompressive Craniectomy and Craniotomy. Early hematoma evacuation may decrease the toxic effects of blood and plasma products, diminish surrounding edema and ischemia, and prevent hematoma expansion^{3,4}. Also, the early craniotomy surgery could lead to dramatic reduction of intracranial pressure (ICP) and improvement in local blood circulation¹¹. Craniotomy had some other advantagessuch as good view and clearance of hematoma completely, easy hemostasis, which could help in outcomes and a reduction in mortality and improve the prognosis in large hematoma. This study demonstrates the surgical outcome amongpatients with the largeICH, Craniotomy was done in 20 patients, among which good outcome in 4 patients (20%) and Decompressive craniectomy was done in 10 Patients, among which good outcome was (20%).No statistical significant (P value-0.542) difference in the outcome of Decompressive craniectomyand Craniotomy in our study.

Following with in 72 hour of ictus surgery in 12 patients, 4(33.33%) patients had good outcome (GOS 4-5) and surgery after 72 hour in 18 patients, 3 (16.66%) had good outcome. It was found that surgery had some improvement in outcome among patients who areyoung and surgery done with in 72 hour of ictus but this relationship between timing of surgery since ictus and outcome is no statistical significant (P value-0.249).

Various authors, including Bogousslavsky et al, Bozzola et al,Portenoy et al, and Sacco et al reported a mortality rate varying from 20% to $70\%^{14}$ Although the mortality is strongly dependent on haematoma size and to a lesser extent, location, the overall mortality rate varies between 25% and $60\%^{75}$ According to Flaherty et al, death at 1 year varies by location, 57% for lobar, 51% for deep ganglionic¹⁵. The mortality rates reported for lobar haemorrhage have been between the extremes of 11.5% (Ropper&Davis, 1980) and 32% (Kase et al., 1982), in comparison with 42% basal ganglionic and thalamic ICH, (Steiner et al., 1984). However in large series of patients comparisons of mortality lobar and deep hemispheric ICH have shown no significant differences (Massaro et al., 1991)

In 6 month follow up period is less for functional outcome and number of patients was also less in our study but functional outcome after 6 month period improved in 4(40%) patient that is significant in 10 survived patient in our study. In our study 7 patients had good outcome after 6 month follow up that was 23.33 %.

CONCLUSION

In Selective Group of patients in our study had high mortality and poor functional outcome. Functional outcome was improve in survived patient in our study after 6 months follow up.

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