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Surgical Outcome of Spontaneous Supra Tentorial Intra-Cerebral Haemorrhage.

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ABSTRACT

Background: Intra-cerebral haemorrhage (ICH) is responsible for strokes in up to 20 % patients in European countries while this became higher up to 30 % in Asian countries. Various different approaches have been applied for the surgery of ICH in the search of ideal surgical technique and prompt management without any success. Therefore, the present study was designed to assess the advantages and risk of open craniotomy surgical technique for the treatment of spontaneous supra tentorial intra-cerebral haemorrhage. **Methods:** This was a descriptive type of study which was conducted in a tertiary care centre. This study included thirty patients of both gender male (21) and female (9) from 18 to 70 years age. Patients with hypertension, spontaneous supratentorial haemorrhage, having Glasgow Coma Scale (GCS) 8-13 and volume of blood 20 ml or above were included in the study. ICH patients with GCS 14-15 and GCS level less than 7 were excluded from the study. **Results:** Results of the current study showed that 6 patients with ICH more than 50 ml had GCS less than 8. Whereas, GCS 9-10 and GCS 11-13 were recorded in 17 and 7 patients respectively before the operation. Further, GCS level was unchanged even after surgery in 6 patients who had pre-operative GCS less than 8. After surgery GCS level improved to 9-10 and 11-13 in 9 and 15 patients respectively. **Conclusion:** Findings of the present study suggest that GCS level and Size of haematoma significantly affects the surgical prognosis in patients with spontaneous supra tentorial intra-cerebral haemorrhage patients. Moreover, results of current study showed that GCS level less than 8 and blood volume of haemorrhage more than 50 ml have been found associated with higher rate of mortality in ICH patients.

Keywords: ICH, GCS, Mortality, hypertensive bleed.

INTRODUCTION

Intra-cerebral haemorrhage (ICH) is responsible for strokes up to 20 % patients in European countries while this became higher up to 30 % in Asian countries.[1,2] ICH is one of the leading causes of mortality and long term disability throughout the world.[3]

Uncontrolled hypertension is most of the time found associated with ICH. Hypertensive arteriosclerosis accounts for more than 75% ICH followed by various other factors like vascular malformations and amyloid angiopathy.[4] ICH is attributed due to high blood pressure leading to perforation of small arteries. This haemorrhage from small arteries mostly occurs at bifurcation due to transmission of pressure gradient from large vessels to small vessels. ICH frequently occurs in deep gray mater structures mostly in basal ganglion followed by thalamus, cerebellum and pons. Computed tomography (CT) Brain is considered as diagnostic tool for ICH in initial phase.[5]

Various different approaches have been applied for the surgery of ICH in the search of ideal surgical technique and prompt management without any success. There is still dilemma about the ideal surgical procedure for spontaneous ICH throughout the world.[6]

The rapid and ideal management of spontaneous ICH require instant surgical treatment to remove maximum part of blood clot as quickly as possible. Different surgical techniques like open craniotomy, CT guided stereotaxic aspiration and simple aspiration of ICH through a burr hole have been prevalent for the treatment of ICH along with their own merits and demerits.[7] Therefore, the present study was designed to assess the advantages and risk of open craniotomy surgical technique for the treatment of spontaneous supra tentorial intra-cerebral haemorrhage.

MATERIALS AND METHODS

This was a descriptive type of study which was conducted in a tertiary care centre. This study was done from January 2013 to December 2018. This

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study included thirty patients of both gender male (21) and female (9) from 18 to 70 years age. Elaborated clinical examination was done before patients were included in the study. CT scan of head was done to confirm the ICH of each and every patient before onset of study. All the patients were evaluated for the surgical management of haemorrhage after the confirmation of ICH via CT scan.

Patients with hypertension, spontaneous supratentorial haemorrhage, having Glasgow Coma Scale (GCS) 8-13 and volume of blood 20 ml or above were included in the study.

ICH patients with GCS 14-15 and GCS level less than 7 were excluded from the study. Further, patients with aneurysm, tumour bleed, intra ventricular bleed and patients using anticoagulants were excluded from the study.

Patients with abnormal location of bleed were further investigated via CT scan angiography. For the differential diagnosis of aneurysm, tumour bleed, arteriovenous malformations etc. CT Angiography and I/V contrast (Brain) was done.

All the patients fulfilling the inclusion criteria were operated and kept under observation in the ICU. Time to time CT scan was done of each patient as per his/her requirement. All the patients were observed at least for three months after discharged from the hospital. All the patients were asked to report for 1st follow up, 2nd follow up and 3rd follow up after 15 days, 1 month and 3 months respectively after the discharge date. Casuality and changes in GCS level were considered as the marker of improvement at three month in all the survivors.

All the descriptive and qualitative data were recorded in the form of various variables like age, sex, location of haematoma, diagnosis, GCS level (at different time as pre, post operation, discharge, at every follow up), mortality etc were recorded on the Performa of each and every patients.

All the results were expressed as mean ± SD and percentage. Entire calculations were done with the help of SPSS v 23software manufactured by USA.

RESULTS

Present study included 30 patients with mean age of 60 ± 11.2 years. Out of these patients 21 patients (70%) were males while 9 patients (30%) females. Majority of study population (14/46.6%) belong to 60 to 70 years age group.

It is evident from fig 1 that volume of intra-cerebral haemorrhage (ICH) was 20 to 40 ml in 53.33% patients. Further, it was 40 to 50 ml and more than 50 ml in 26.66% and 20% patients respectively. Further, all the patients having ICH more than 50 ml could not survive after the surgery due various complication and re-bleeding.

Basal ganglion region was the location of intra-cerebral haemorrhage in majority of the patients (25); while intra-cerebral haemorrhage location was lobar areas in 5 patients.

Table 1: Basic characteristics of patients

Age groups (Years)	Male		Females		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
18-39	--	--	--	--	--	--
40-49	2	6.66%	1	3.33%	3	10%
50-59	9	30%	4	13.33%	13	43.33%
60-70	10	33.33%	4	13.33%	14	46.66%
Total	21	70%	9	30%	30	100%

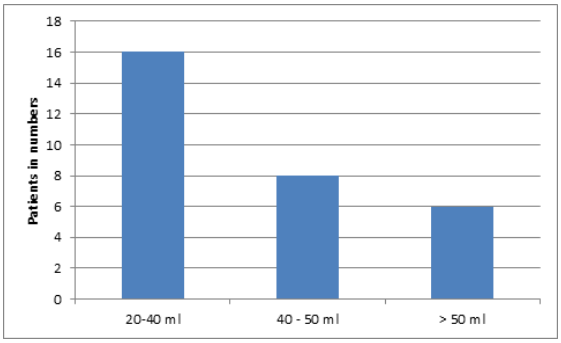

Figure 1: Intracerebral hemorrhage volume

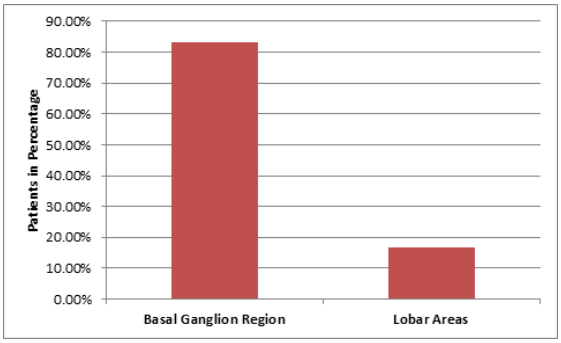

Figure 2: Location of intra-cerebral haemorrhage

All the patients were distributed in three groups according to GCS during the time of admission. Results of the current study showed that 6 patients with ICH more than 50 ml had GCS less than 8. Whereas, GCS 9-10 and GCS 11-13 were recorded in 17 and 7 patients respectively before the operation. Further, GCS level was unchanged even after surgery in 6 patients who had pre-operative GCS less than 8. After surgery GCS level improved to 9-10 and 11-13 in 9 and 15 patients respectively. None of the patients had 14-15 GCS immediately after the operation. Six out of six patients having GCS <8 expired after the surgery during the time hospital stay. At the time of discharge 24 patients showed GCS 11-13.

Out of 24 patients, 17 patients showed improvement in GCS at the time of 1st follow up. Whereas, all the survived 21 patients showed GCS 14-15 at the time

of 2nd follow up. Twenty percent mortality rate and eighty percent survival rate were recorded in our study at the time of discharge from the hospital. Further, we lost three patients at the time of second follow up. However rest of the 21 showed similar improvement at the time of 3rd follow up.

Table 2: Distributions of post operative patients according to GCS

GCS	<8 GCS	9-10 GCS	11-13 GCS	14-15 GCS
Before surgery	6 (20%)	17 (56.66%)	7 (23.33%)	-
After surgery	6 (20%)	9 (30%)	15 (50%)	-
At the time of discharge	-	-	24 (80%)	-
1st follow up	-	-	7 (23.33%)	17 (56.66%)
2nd follow up	-	-	-	21(70%)
3rd follow up	-	-	-	21 (70%)

DISCUSSION

Results of the current study showed that maximum number of spontaneous ICH patients belong to the 50 to 70 years age groups. However, results of the present study were not potentially explicated as control group was dissimilar to the study population. Results showed that there are various other factors including age, site, volume, size, area affected by haemorrhage, consciousness level and status of blood into the subarachnoid space and ventricles along with modus operandi of treatment which may affect the outcome of surgery in such patients. These findings are very similar to the previous study of Inagawa et al,[8] as they concluded that different factors like severity and site of haemorrhage are directly related to the outcome in the long term or short term treatment in patients suffering with ICH.

Results of our study showed that Basal ganglion region was the location of intra-cerebral haemorrhage in majority of the patients. Lobar areas were the site of intra-cerebral haemorrhage in few patients. These findings are in agreement with the findings of earlier study of Inagawa et al,[8] as they recorded putmen and thalamus were the commonest site of ICH in 67% patients while, lobar areas were the location of haemorrhage in 15% patients. However, mortality rate was quite higher in their study compare to our study.

Similarly, Hossian et al,[9] observed basal ganglion (71%) was the commonest site of ICH and lobar region (29%) was less common location of ICH.

Present study observed death rate of 20% up to the time of discharge. In addition all the expired patients had haematoma volume more than 50 ml and GCS score less than 8 in our study. These findings are consistent with the previous study of Hossian et al,[9] as they recorded a strong relationship of poor out come after surgery with GCS<8 and blood volume more than 60 ml in spontaneous supra tentorial intra-cerebral haemorrhage patients. Moreover, they observed a death rate of 31% in intra-cerebral haemorrhage patients after the surgery in their study.

Alike, Broderick et al concluded that higher preoperative haemorrhagic volume and lower GCS are strong predictor of higher rate of mortality in spontaneous ICH patients.

Further, in a study Mendelow AD et al,[11] reported that higher mortality rate has been found associated with GCS 5-8. Moreover, they recoded mortality rate as high as up to 90% in patients having GCS 5-8.

Yelmez et al,[12] conducted a study on comatose patients having GCS equal to or less than 8. They concluded that first line of treatment should be craniotomy to improve the success rate in such patients. Moreover, they suggested that there is poor outcome of surgery in patients having more than 60 ml volume of haematoma in comparison to those patients having poor GCS and smaller haematoma had a better outcome of surgery.

Present study observed that all the patients having less than 8GCS and haematoma volume more than 50ml expired. These findings are consistent with earlier studies of Hemphill JC et al,[14] and Pai SB et al,[15] as they recorded high rate of casuality in spontaneous ICH patients having higher haematoma volume and less than 8 GCS.

CONCLUSION

Findings of the present study suggest that GCS level and Size of haematoma significantly affect the surgical prognosis in patients with spontaneous supra tentorial intra-cerebral haemorrhage. Moreover, results of current study showed that GCS level less than 8 and blood volume of haemorrhage more than 50 ml have been found associated with higher rate of mortality in ICH patients. However, rapid and attentive surgical approach can improve the surgical outcome in ICH patients.

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