FUNCTIONAL OUTCOME IN PATIENTS WITH SUPRA TENTORIAL HYPERTENSIVE INTRACEREBRAL HEMORRHAGE AFTER SURGICAL INTERVENTION

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ABSTRACT

Objectives: To determine the functional outcome in patients with supratentorial intracerebral hemorrhage after surgical intervention.

Study Design: Retrospective descriptive study.

Place and Duration of Study: This study was carried out at the department of Neurosurgery, Combined Military Hospital Rawalpindi (CMH), from Jan 2015 to Dec 2015.

Material and Methods: Retrospectively the records of eighty two patients with a diagnosis of supratentorial hypertensive intracerebral bleed on computed tomography scan (CT) brain, who were surgically managed in our department over one year period, were collected and evaluated. All the patients had undergone clinical examination, baseline investigations including complete blood counts, urea, creatinine, electrolytes, prothrombin time (PT), partial thromboplastin time (PTTK), electrocardiography (ECG) and chest x-ray. In case of deranged coagulation profile platelets or fresh frozen plasma were transfused preoperatively. Outcome of patients was assessed by Glasgow outcome scale (GOS) at 3 months after surgery. A GOS score of 4 and 5 was considered favorable outcome and score of 1, 2 and 3 was considered unfavorable outcome, and these were noted in proforma. Descriptive statistics for age, gender, hospital stay and clinical outcome were calculated by using SPSS version 20.

Results: Eighty two patients of supra tenteorial bleed were operated over the study period. The mean age of patients was 44.82 ± 9.25 years and the average hospital stay was 13.21 ± 4.41 days. Fifty six patients (68.3%) were male while 26 (31.7%) were female. Favorable outcome at three months was observed only in 24 patients (29.26%) while unfavorable outcome in 58 (70.73%) cases.

Conclusion: Unfavorable results at three months after surgery were observed in 70.73% of patients in our sample suggesting poor functional outcome in early evacuation of supratentorial bleed.

Keywords: Glasgow coma scale, Intracerebral hemorrhage, Stroke.

INTRODUCTION

Hypertensive intracerebral hemorrhage is a type of stroke in which there is bleeding in the brain due to high blood pressure. Spontaneous intracerebral hemorrhage continues to be a major medical and socioeconomic problem[1]. Intracerbral hemorrhage account for 15 to 20% of strokes, the condition carries a higher mortality and morbidity than occlusive stroke[2]. Until very recently, no specific therapies have been demonstrated to improve outcome after spontaneous intracerebral hemorrhage. Due to the lack of benefit observed in the surgical treatment for intracerebral hemorrhage trial (STICH), emergency surgical evacuation should be reserved for patients with large lobar hemor-rhage, mass effect and rapidly deteriorating clinical condition[3]. Results of surgical treatment depends on the severity of the patient's state, the degree of impairment of consciousness, volume and location of hematoma, ventricular hemorrhage and in less degree on the terms of operation and the degree of displacement of the median structures of the brain[4]. Surgical management of hypertensive intracerebral hematoma in selected patients is associated with lower rate of mortality in comparison with conservative treatment[5]. Ventilatory support, blood pressure reduction,

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intracranial pressure monitoring, osmotherapy, fever control, seizure prophylaxis and nutritional supplementation are the cornerstones of supportive care in intensive care units[6]. It is estimated that within 30 days of the intracerebral hemorrhage ictus, 35% to 52% of patients are likely to die and only 20% are expected to be functionally independent at 6 months[7-11]. Mendelow and colleagues led a team to compare early surgical intervention with conservative therapy in the STICH trial. The trial randomized 1,033 patients in 27 countries to early surgery or conservative treatment. The primary outcome was death or disability, measured using the glascow outcome scale (GOS), at six months. Overall, a favourable outcome (GOS of 4, 5) at six months was reported in 26% of surgical patients and 24% of conservative treatment patients[12]. In our study a treatment strategy of surgery plus the routine medical management was initiated and assessed whether it reduces disability in survivors of primary supratentorial intracerebral hematoma. The rationale of this study is to determine the magnitude of satisfaction in surgical treatment of intracerebral hemorrhage so that the same treatment may be adopted and recommended in similar cases in future.

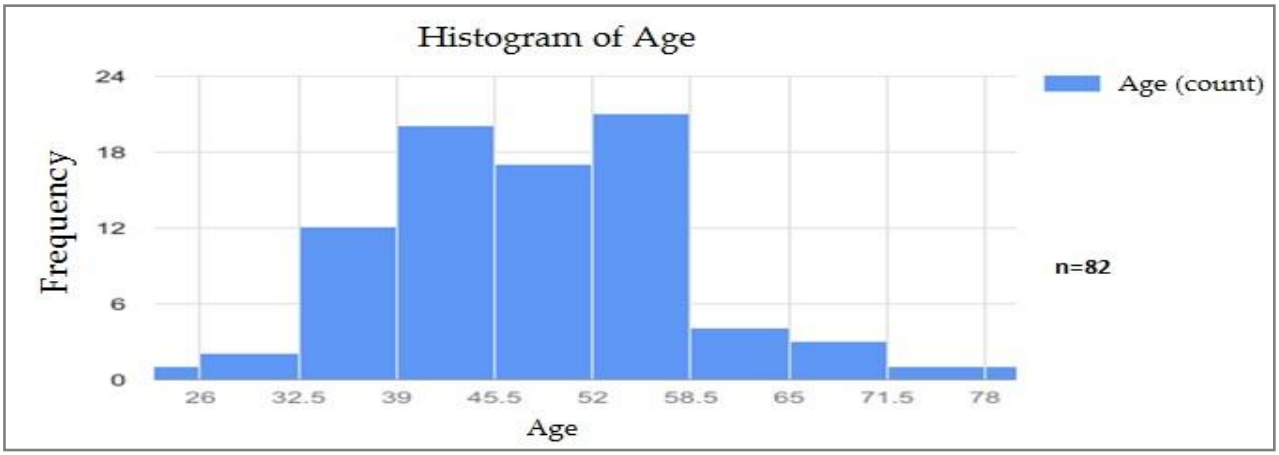

Figure: Histogram of Age.

PATIENTS AND METHODS

This descriptive retrospective study was carried out at Combined Military Hospital Rawalpindi, Neurosurgery department from 1 January 2015 to 31 December 2015. Records of all the patients admitted and operated for supratentorial hemorrhage during this period were evaluated. A total of 82 patients were included in the study. All these patients who were selected by consecutive sampling method had supratentorial hypertensive intracerebral bleed in subcortical, parietal, temporal, occipital and thalamic region on computed tomography (CT) scan brain. It appeared as an irregular area of increased density (blood clot) surrounded by area of low density (edematous brain) with midline shift of more than five millimeter. The volume of blood was calculated and intervention was done in case of blood volume of 25 cubic centimeter or more. All of these patients including both genders were admitted through trauma centre. Patients who had GCS of more than 6 and surgery within one week of onset were included in the study. Patients having intracerebral hemorrhage secondary to arteriovenous-malformation, ruptured aneurysm, tumors, bleed with intraventricular extention, involving brain stem and cerebellar region and finally bleed of more than one week were excluded from the study. All the patients were inquired regarding history of hypertension, hemiplegia, and duration of ictus. Clinical examination was done and GCS, power, pupils were checked. Base line investigations included complete blood count, urea, creatinine, electrolytes, prothrombin time (PT), partial thromboplastin time (PTTK), electro-cardiobraphy (ECG)

and chest X-ray were carried out. Platelets were transfused peroperatively in patients with deranged coagulation profile. Informed written consent for surgical intervention was obtained in all cases. Surgical intervention included both burr hole aspiration and craniotomy for evacuation/ drainage of hematoma. There was no perioperative mortality. Outcome of patients was assessed at three months after surgery by GOS. Score 4 and 5 was considered favorable outcome and score 1, 2 and 3 was considered unfavorable outcome. Data were entered into a spreadsheet (Excel; Microsoft Inc, Redmond, WA) over the course of the study and analyzed using a statistical package for social science (SPSS version 20). The categorical variable age groups, gender and functional outcome were computed in frequency and percentage. The numeric observations like age and hospital stay were computed by mean, standard deviation, 95% confidence interval and median.

RESULTS

A total of 82 diagnosed cases of supratentorial hypertensive intracerebral bleed on CT scan brain were included in this study. Majority of the patients were between 41 to 60 years of age, as presented in figure. Mean age of the patients was 44.82 ± 9.25 years (95% CI: 46.1 to 49.88). Similarly, the average hospital stay was 13.21 ± 4.41 (95% CI: 10.78 to 12.57). Out of 82 patients 56 (68.3%) were male and 26 (31.7%) were female, with male to female ratio of 2.15:1. Favorable outcome (GOS 4 and 5) at three months was observed in 24 (29.26%) patients while unfavorable outcome (GOS 1, 2, 3) was seen in 58 (70.73%) cases. Unfavorable outcome was observed in higher age groups i.e. more than 50 years of age (>85%) as shown in table-I. It was also seen that unfavorable outcome was present in 70% of male and 79.2% of female patients as shown in table-II. In our study the outcome based on the hospital stay is shown in table-III.

Table-I: Functional outcomewith respect to age groups (n=82).

Age Groups	n	Functional Outcome	
		Favourable	Unfavourable
Less than 30 Years	1	1 (100%)	0 (0%)
30 to 40 Years	14	8 (57.14%)	6 (42.86%)
41 to 50 Years	34	17 (50%)	17 (50%)
51 to 60 Years	29	8 (27.59%)	21 (72.41%)
61 to 70 years	3	1 (33.33 %)	2 (66.67 %)
71 to 80 years	1	0(0 %)	1 (100 %)

Table-II: Functional outcomewith respect to gender (n=82) (p=0.46).

Gender	n	Functional Outcome	
		Favourable	Unfavourable
Male	56	17 (30.36%)	39 (69.46%)
Female	26	8 (30.77%)	18 (69.23%)

Table-III: Functional outcomewith respect to hospital stay (n=82).

Hospital Stay (days)	n	Functional Outcome	
		Favourable	Unfavourable
1 to 5	1	1 (100%)	0 (0%)
6 to 10	9	5 (55.56%)	4 (44.44%)
11 to 15	19	8 (42.11%)	11 (57.89%)
16 to 20	26	8 (30.74%)	18 (69.23%)
Greater than 20	27	4 (14.81%)	23 (85.19%)

DISCUSSION

In our study, 56 patients (68.3%) were male and 26 patients (31.7%) were female. The male preponderance in our series was similar to the study conducted by Freytag[13] whereas Young *et al*[14] observed no significant difference between the males (60) patients and females (53) patients. The mean age of patients with hemorrhage in our

study was 44.82 ± 9.25 years which was different from study conducted at Agha Khan University Hospital Karachi performed by Razzaq and Hussain[15]. Mean age of patients in their study was 57 years. Comparing with the largest multicenter randomized controlled trial, the international surgical trial in intracerebral hemorrhage 2005 (STICH-I)[12], the median age of patients in the study was 62 years. More than half of the patients were males. Regarding functional outcome, favorable outcome was noticed in 24 patients (29.26%). It was in accordance with the largest multicenter randomized controlled trial, but they compared conservative treatment with surgical intervention. Twenty six percent patients allocated to early surgery had a favorable outcome at 6 months while 24% patients had favorable outcome in the conservative treatment group. In STITCH-II (2013) 307 patients were randomly assigned to early surgery and 294 to initial conservative treatment; 297 and 286 were included in the analysis respectively, at the end of six months. Favorable outcome was observed in 41% patients in the early surgery group versus 38% patients in the initial conservative treatment group. In our study it was 29%. Thus STICH-II results confirm that early surgery does not increase the rate of death or disability at 6 months and might have a small but clinically relevant survival advantage for patients with spontaneous superficial intracerebral hemorrhage without intraventricular hemorrhage[15,16]. None of the studies yet has described guidelines regarding optimum timing of surgery. Mean time delay from ictus to craniotomy was 14.5 hours in study. Zuccarelo *et al*[21] reported mean time delay to be 8.5 hours. In accordance with these studies mean time from ictus to craniotomy in our series was 12 hours. Comparing with study by Kanaya[10,17] who has reported mortality of 23.8%, it was 30% in case of our study. This was comparable with the study conducted by Qureshi, *et al*[11] (28.13%) at Liaquat University of Medical and Health Sciences. Comparing with study of Nishihara et al[1], 5 patients in our study underwent endoscopic evacuation of hematoma and these patients had a shorter duration of hospital stay and early discharge; where as in his study, twenty-seven cases underwent endoscopic evacuation[18]. The results of our study clearly demonstrated that after evacuation of hematoma, adjuvant medical treatment like good control of blood pressure and seizures, post op ventilation to reduce ICP, tracheostomy to combat chest infection and control of fluid and electrolytes are the important aspects of managing patients with intracerebral hemorrhage[17,19]. In the absence of proper randomized multicenter study the appropriate management of intracerebral hemorrhage is undecided[20]. To identify and deliver the best care, large randomized prospective trials must be conducted. In such studies investigators need to separate intracerebral hemorrhage by location and match baseline characteristics like hematoma volume and GCS. They need to investigate the utility of one surgical modality at a time instead of grouping all modalities together. A large sample size will be required to allow not only to determine which patients would benefit most from surgical treatment, but also to define the optimal timing and methods for removing the hematomas[16].

CONCLUSION

Unfavorable results at three months after surgery were observed in 70.73% of patients in our sample suggesting poor functional outcome in early evacuation of supratentorial bleed.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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