Section: General Medicine

Original Research Article

CLINICAL PROFILE AND OUTCOME OF PATIENTS WITH INTRACEREBRAL HAEMORRHAGE USING ICH SCORE AT ADMISSION AND 30 DAYS FOLLOW UP

Chandrashekhar N[1], Diwakar T N[2]

[1]Assistant Professor, Department of General Medicine, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India
[2]Professor, Department of General Medicine, Bangalore Medical College and Research Institute, Bangalore, Karnataka, India

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Corresponding Author:
Dr. Chandra Shekhar N,
Email: chhandu123@gmail.com

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Abstract

Background: Intracerebral haemorrhage constitutes 10% to 15% of all stroke. ICH score has been used a simple tool predict outcome in patients with Acute Intracerebral haemorrhage. The ICH score was the first to be developed to predict 30day mortality in patients with acute intracerebral haemorrhage and has been validated by different cohorts all over the world. **Aim**: The aim is to estimate ICH score at admission and 30 days follow up in patients with Intracerebral haemorrhage, admitted in an Indian setting, with clinical outcome. **Materials and Methods:** 60 patients presenting with acute Intracerebral haemorrhage admitted in the Hospitals attached to BMCRI, during the period of 1st September 2019 to 30th November 2021 were studied. Qualifying patients underwent detailed history and clinical examination. All patients underwent Non contrast CT scan and ICH score was calculated. The primary end point was mortality at 30 days. **Results:** The mean age was 53.60±14.44 years with female of 54.7% and male of 47.6%. Most common site of ICH was Basal ganglia. Most common cause of ICH was Systemic hypertension. 30-day mortality rate in this study was 30 %. Important predictor of mortality was ICH score ($p < 0.001$), GCS Score ($p = 0.0053$), Size of bleed($p=0.138$), Intraventricular extension ($p = 0.754$), Infratentorial location of bleed ($p = 0.514$). **Conclusion:** ICH score is simple, easy to use and can be easily trained to others. It predicts 30 days mortality reliably. Individual parameter of ICH by themselves also predicts 30 days mortality. ICH score can be used as a tool to prognosticate a patient with ICH. Mortality rate in this study is slightly higher as compared with other study.

INTRODUCTION

Intracerebral hemorrhage accounts for 10 to 15% of first-time strokes world over.[1] Incidences are predicted to be higher in Asian population.[2] The 30day mortality ranges from 32% to 55 %.[2] Of the total patients with ICH only 20 % Of patients are expected to be functionally independent at the end of 6 months.[2]

A stroke, or cerebrovascular accident, is defined as an abrupt onset of a neurologic deficit that is attributable to a focal vascular cause.[3]

Extravasation of blood into the brain parenchyma was recognized as early as 1658 by Wepfer,[4] although he saw the clot as an obstruction of 'vital spirits' rather than as the disease in itself, and subsequently by Morgagni.[4] The cause remained obscure, and to a large extent still it is.[4]

We have come a long way since the time when Charcot (1881) felt "that if apoplexy was not immediately fatal, most survivors only retained life at the expense of deplorable infirmities and perpetual confinement to bed." With the arrival of computed tomography of the brain, diagnosis of intra-cerebral hemorrhage has been taken from the age of calculated speculation with details of clinical features, angiograms and 'bloody taps' to the present day of arrival of a definitive diagnosis in a matter of minutes.

A significant reason for the decreasing trend of mortality in the intra-cerebral hemorrhage patients in the industrialized countries have also been due to the identification of the factors which might adversely affect the outcome, stratifying patients and instituting prompt acute stroke care.

Though medical management of intra-cerebral hemorrhage has been the way, surgical management

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has been known since the times of McEwen, who performed the first successful operation for intra-cerebral hematoma in 1883.

Though no definite guidelines exist to decide between the two lines of management, the increasing availability of minimally invasive techniques like stereo-tactic aspiration may make this modality indispensable in the days to come.

Identifying definite risk factors, designing and implementing policies to contain them, making prompt and accurate diagnosis, stratifying patients according to outcome predictors, and thus ensuring prompt referral of deserving critical patients to tertiary centers for intensive management, may be the need of the hour as we wait to embrace the newer advances into our management protocols.

Intracerebral hemorrhage accounts for approximately 10% of strokes and its clinical importance derives from its frequency and accompanying high mortality. Although the latter is strongly dependent on Hematoma Size and to a lesser extent, Location, the overall mortality rate varies between 25% and 60%.[5] There has been a general decline since the 1980s in the incidence of stroke, including ICH, as a result of improved detection and treatment of hypertension. However, ICH continues to be a major health problem especially in those who lack hypertension treatment and the genetically predisposed.

MATERIALS AND METHODS

IPD of Hospitals affiliated to BMCRI Bangalore.

Methods Of Collection of Data:

Study design: Observational prospective study

Study period: Nov 2019 to May 2022

Place of study: Hospitals affiliated to BMCRI Bangalore

Sample size: 60

Based on previous study conducted by Ojha P, Sardana V, Maheshwari D, Bhushan B and Kamble S, the hemorrhage was supratentorial location in 108 patients i.e., 75 %,

Thus, the Sample size is calculated using the formula,

$$n = Z\alpha^2 \frac{pq}{d^2}$$

Where Zα = Standard table value for 95% confidence interval

p= proportion of patients having supratentorial hemorrhage=

75%

q= 100-p = 25%

d = precision= 15 % relative precision= 11.3

$$n = Z\alpha^2 \frac{pq}{d^2}$$

$$n = \frac{(1.96)^2 \times 75 \times 25}{(11.3)^2} = 56.41$$

n~57

Total Sample Size rounded off to 60.

Inclusion criteria:

- Age more than 18 years
- Patient willing to give informed consent
- All patients diagnosed to have acute ICH diagnosed by CT Brain.

Exclusion criteria:

- Patient not willing to give informed consent
- Patients with trauma
- Patients with subdural and epidural hematoma
- Aneurysms, AV malformations, anticoagulant and coagulopathy related hemorrhages.

Methodology:

The study is a hospital based Prospective study between November 2019 to November 2021 in a tertiary care referral hospital. After obtaining approval and clearance from the institutional ethics committee of BMCRI. Written informed consent (Annexure 1) will be taken from the patients. Clinical examination and investigations will be done and Data will be collected using a pro for a (Annexure 2)

Assessment tools

ICH score is a 0-6point calculation based on five clinical indicators:

- Age
- GCS
- Volume of hematoma on CT scan
- Infratentorial origin of hematoma
- Intraventricular extension

Outcome Measures

- Improvement in GCS Score
- Need of surgery
- Morbidity and mortality

Statistical Analysis

- The data collected will be analyzed statistically using descriptive statistics namely mean, standard deviation, percentage wherever applicable.
- Appropriate Parametric and non-parametric tests will be used.

ICHSCORE

CLINICAL OR IMAGING FACTORS	POINT SCORE
Age	
<80 years	0
>80 years	1
Hematoma volume	
<30 cc	0
>30 cc	1
Intraventricular Hemorrhage present	
No	0
Yes	1
Infratentorial origin of ICH	
No	0
Yes	1
Glasgow Coma Scale	
13-15	0
5-12	1
3-4	2
Total Score	0-6 sum of eachcategory

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RESULTS

Total number of patients in this study is 60. Most patients were within age group of 40 to 59 years, (47%) and where as 14 % of the patients were less than 40 years. Mean age in this study was 53.6±14.4 years. In this study p value of <0.05 was considered statistically significant.

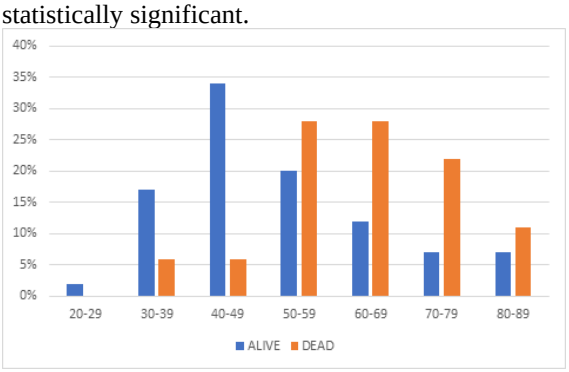

Figure 1: bar graph showing age distribution of patients

Out of 60 subjects, 1(2%) were of age group 20-29 years, 8 (14%) were 30-39 years, 15(25%) were of age group 40-49 years, 13(22%) were of age group 50-59 years, 11(17%) were 60-69 years, 7(12%) were 70-79 years, and 5(8%) were between 80-89 years of age.

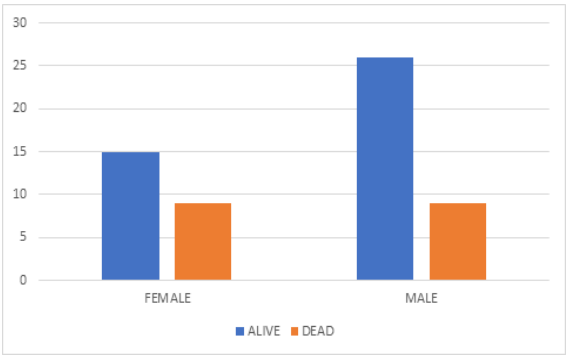

Figure 2: bar graph showing sex distribution

Out of 60 subjects 24(41%) were females and 36(59%) were males. No significant association was found between sex and outcome of the patients as p>0.05.

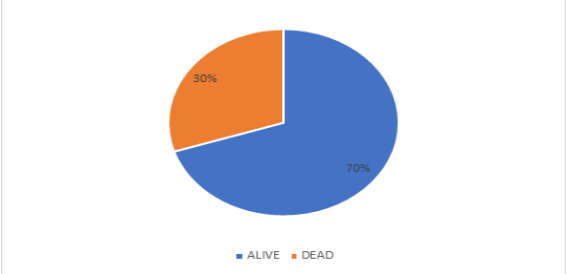

Figure 3: pie chart showing mortality rate of patiens

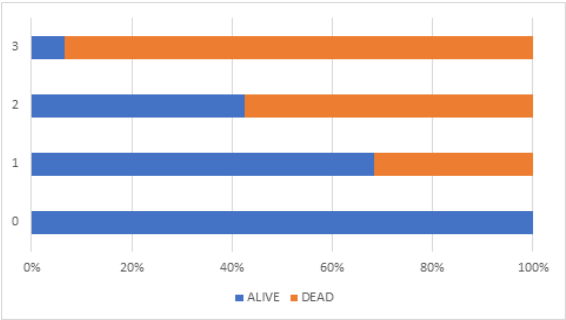

Figure 4: bar graph with distribution of patients with ICH score at admission

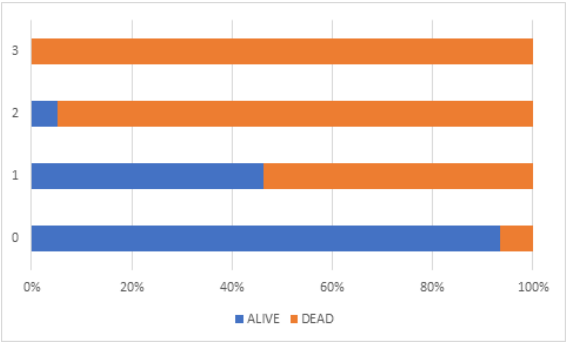

Figure 5. bar graph with distribution of patients with ich score at 30 days follow up

Table 1: age distribution of the patients.

AGE	ALIVE		DEAD		Total	
	N	%	N	%	N	%
20-29	1	2%		0%	1	2%
30-39	7	17%	1	6%	8	14%
40-49	14	34%	1	6%	15	25%
50-59	8	20%	5	28%	13	22%
60-69	6	12%	5	28%	11	17%
70-79	3	7%	4	22%	7	12%
80-89	3	7%	2	11%	5	8%
Grand Total	42	100%	18	100%	60	100%

Table 2: sex distribution of the patients

SEX	ALIVE		DEAD		Total		P-value
	N	%	N	%	N	%	
Female	15	37%	9	50%	24	41%	
Male	27	63%	9	50%	36	59%	0.395
Grand Total	42	100%	18	100%	60	100%	

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Table 3: mortality rate of patients

Outcome	N	%
Alive	42	70%
Dead	18	30%
Grand Total	60	100%

Table 4: Distribution of patients with ich score at admission

ICH score at admission	Alive		Dead		Total		P-value
	N	%	N	%	N	%	
0	2	5%		0.00%	2	3.33%	0.0001
1	25	60%	5	27.78%	30	50.00%	
2	14	33%	8	44.44%	22	36.67%	
3	1	2%	5	27.78%	6	10.00%	
Grand Total	42	100%	18	100.00%	60	100.00%	

Table 5: distribution of patients with ich score at 30 days follow up

ICH score after 30 days	ALIVE		DEAD		Total		
	N	%	N	%	N	%	P-value
0	33	78.57%	1	5.56%	34	56.67%	0.0001
1	8	19.05%	4	22.22%	12	20.00%	
2	1	2.38%	8	44.44%	9	15.00%	
3		0.00%	5	27.78%	5	8.33%	
Grand Total	42	100.00%	18	100.00%	60	100.00%	

Table 6: correlation of patients with ich score at admission and at 30 days follow up

Correlations			
	ICH score at admission	ICH score after 30 dyas	Status of patient
Pearson Correlation	0.425**	0.701	0.425
P-VALUE	0.001	0.000	0.001
N	60	60	60

The Pearson correlation analysis shows that there was positive significant correlation between the ICH score and mortality. It concludes that with increase in ICH score mortality increases.

DISCUSSION

Haemorrhagic stroke has devastating consequences. The need to identify potential risk factors, initiate corrective measures, and customize treatment cannot be overemphasized, especially in resources limited setting as in India. Published epidemiological studies related to haemorrhagic stroke from India are sparse. This study group comprising of 60 patients with intracerebral hematoma.[6-8]

Age and Sex

Primary ICH is considered to be a disease of the elderly. The mean age of the study group in Hemphill et al.'s landmark paper was 66 years. The mean age of patients in our study was 54 ± 15, and only 8% were above 80 years in our group. This comparatively younger age of incidence has been reported uniformly across India and appears to be a characteristic feature of the ICH in the Indian subcontinent. Increasing age is also associated with increased morbidity. Several authors have shown that older adults with acute ICH experienced the worse outcomes compared with their younger counterparts, including death, dependency, and overall quality of life.[9-12]

ICH Scoring

In the present study significant difference in the mean values of ICH scores (both at admission and after 30 days) was found between the groups as $p<0.05$. Subjects with poor outcome had significantly more ICH scores compared to the subjects with good outcome.[13,14]

Several scores for predicting functional outcome and mortality after ICH have been developed. The ICH score proposed by Hemphill has stood the test of time for prognosticating ICH. The Essen ICH score is determined only by clinical variables (age, the severity of neurological deficits, and level of consciousness) and has the advantage of not requiring the measurement of ICH volume. The FUNC score additionally takes into consideration the occurrence of pre ICH cognitive impairment. More recently, scores like the BAT score have been designed for identifying predictors of hematoma expansion. In the present study the ICH score was applied. In an earlier publication, Hegde et al. attempted to validate the ICH score in an Indian setting and suggested reducing the age cut off from 80 years to 70 years in the original ICH score. This was influenced by the fact that the mean age of the affected group in our study as well as in other Indian studies is much younger compared to the Western population. However, Pinho et al. concluded that even though the use of prognostic scores is recommended other factors must also be weigh when evaluating individual patients and an early subjective clinical judgment by experienced clinicians is not inferior to the application of formal prognostic scores in predicting outcome.[15-20]

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CONCLUSION

This study concludes that ICH score is simple, easy to use and can be easily trained to others. It predicts 30 days mortality reliably. Individual parameters of ICH by themselves also predicts 30 days mortality. ICH score can be used as a tool prognosticate a patient with ICH. Most common site of ICH was Basal ganglia while most common cause was Hypertension. The mortality rate in this study was 30%. ICH score may be used as tool to make treatment guideline and clinical research in patients with ICH.

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