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Original Research Article

ICH Score as a Predictor of Mortality in Patients Presented with Intracerebral Haemorrhage in Tertiary Care Hospital.

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Abstract

Background: Intracerebral hemorrhage (ICH) constitutes 10% to 15% of all stroke patients. It is a simple tool for outcome prediction (mortality rate) for intracerebral haemorrhage patients. This score is of prognostic significance in non-traumatic bleed and calculated in non-traumatic bleed. It consists of 5 characteristics including age>80 years, Glasgow coma scale, infratentorial location, ICH volume and presence of IVH. The study aimed to validate the prediction of mortality in intracerebral haemorrhage patients in tertiary care hospitals.

Methodology: A retrospective observational study of 150 patients admitted with intracerebral haemorrhage in tertiary care hospital from August 2020 to July 2021. Descriptive analysis was done. Statistics were analyzed using SPSS version 15.0.

Result: The volume of bleed was calculated in 150 patients by the ABC/2 method. 125 patients presented with a volume of bleed less than 30 cc. 25 patients presented with a volume of bleed more than 30 cc and out of which 10 patients (40%) were expired.

Conclusion: ICH score is a simple grading scale. Each increase in the ICH score is associated with a progressive increase in mortality. In this study, no patient with scores 0 died, whereas all patients with scores 5 and 6 died. This study findings showed that increase in the ICH score is associated with a progressive increase in mortality.

Keywords: Intracerebral haemorrhage, ICH score, GCS score, Mortality rate.

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Introduction

Intracerebral haemorrhage (ICH) constitutes 10% to 15% of all stroke patients. [1,2] Intracranial haemorrhage is caused by bleed directly into or around the brain and produces neurologic symptoms by producing a mass effect on neural structures, from the toxic effects of blood itself, or by increasing intracranial pressure.

Intracranial bleed is further divided into subtypes which are intracerebral bleeds which consist of intraventricular bleeds and intraparenchymal bleeds, subarachnoid bleeds, epidural bleeds and subdural bleeds. The bleed can occur as a consequence of trauma or non-traumatic causes such as a ruptured aneurysm.

ICH score is a simple tool for outcome prediction (mortality rate) for intracerebral haemorrhage patients. It is of prognostic significance in non-traumatic bleed, so it is calculated in non-traumatic bleed. The score consists of 5 characteristics including age >80 years, Glasgow coma scale, infratentorial location, ICH volume and presence of IVH. [3] The simple ICH score has been validated in different populations. The mortality rate of patients with ICH at 30 days varies from 13 to 61% [4,5,6,7]

Each characteristic is an independent predictor of mortality after 30 days of the onset of stroke.

Intracranial haemorrhage is a life-threatening medical emergency because it leads to serve an increase in intracranial pressure which can cause herniation of the brain also the build-up of blood within the skull can lead to a further increase in intracranial pressure, which can crush delicate brain tissue or limit its blood supply. Patients presenting to the emergency department with ICH must be rapidly diagnosed, managed and transported to an ICU or operating room.

Aims and objectives:

1. To estimate the demographic and clinical profile of patients presenting with non-traumatic intracranial bleed in the emergency medicine department.

2. To predict mortality by using the ICH score as an independent predictor in patients with intracerebral haemorrhage

A. To determine on admission GCS score and its relation with mortality outcome in case of traumatic and non-traumatic intracranial bleed.

B. To determine the volume of bleed on CT scan(by abc/2 method) and its relation with mortality outcome.

Material and methods:

In this retrospective observational study, 150 patients with intracerebral haemorrhage were evaluated. Data were retrospectively collected from the department of Emergency medicine at Sardar Vallabhbhai Patel institute of medical sciences and research North India. Patient data were collected over a period of 11 months from August 2020 to July 2021. All study participants underwent a CT scan of brain plain in the department of radiodiagnosis at Sardar Vallabhbhai Patel institute of medical sciences and research. Patient demographic details such as age and gender, and characteristics of intracranial bleed on CT scan brain plain collected.

Inclusion criteria:

1. Adult patient >=18 years of age

2. Patient diagnosed with an intracranial bleed on CT scan brain plain

Exclusion criteria:

1. Age < 18 years

2. Patient having a traumatic intracranial bleed

3. Polytrauma patients

Statistical analysis

The personal identifiers of the patients (Penitents' names and addresses) were kept confidential and secure. Each patient was

given a Unique ID number to make each entry anonymously. Descriptive analysis was done. In this study, descriptive statistics were analyzed using SPSS version 15.0.

Results:

A total of 150 patients with intracerebral haemorrhage were included in this study. The demographic characteristics are shown in table-1. In this study, the youngest patient was 21 years of age and the oldest was 95 years of age. The proportion of ICH was maximum in the age group of 41-60 years which comprises 44.67% of total patients followed by 34.67% of patients in the age group of 61-80 years. Table 1

Table 1: age wise distribution of patients with spontaneous intracranial bleed included in this study

AGE GROUP	NO. OF PATIENTS	PERCENTAGE (%)
20-40	23	15.33
41-60	67	44.67
61-80	52	34.67
>80	8	05.33
TOTAL	**150**	**100**

In this study, 65.3% of patients were male whereas 34.7% of patients were female. The ratio of males to females is 1.88:1. Shown in figure 1

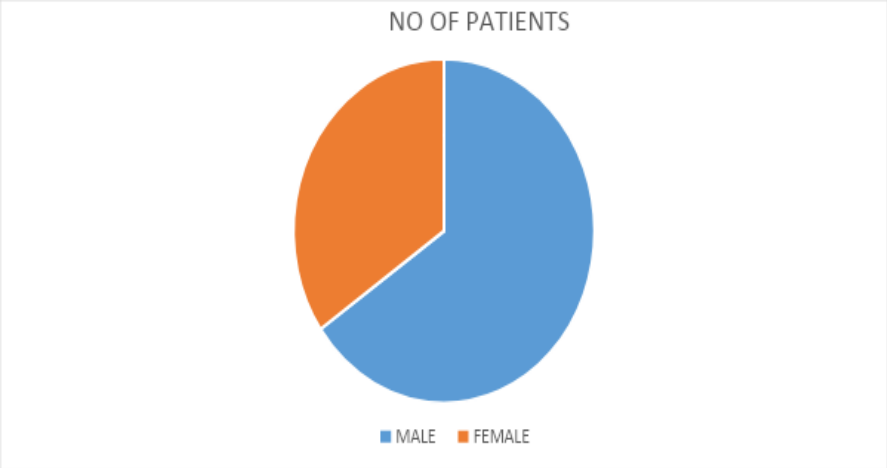

Figure 1: Gender-wise distribution of patients with spontaneous intracranial bleed included in this study

Out of the 150 patients presenting with spontaneous intracranial bleed, 108 patients (72%) were discharged, 12 expired (8%) and 30 patients (20%) took LAMA. Table 2.

Table 2: outcome of patients of spontaneous intracranial bleed included in this study

Outcome	No .of patients	Percent
Discharge	108	72.0%
Expired	12	8.0%
LAMA	30	20.0%
Total	**150**	**100.0%**

In this study out of the 150 cases of spontaneous intracranial bleed, 50 patients had IVH i.e. ventricular extension, out of which 8 patients (16%) expired and 100 patients didn't have IVH out of which only 4% patients expired. Table 3

Table 3: Intraventricular extension in spontaneous intracranial bleed and correlation with mortality outcome

IVH EXTENSION	DISCHARGE	EXPIRED	LAMA	TOTAL
YES	30(60%)	8 (16%)	12(24%)	50
NO	78(78%)	4(4%)	18(18%)	100
TOTAL	**108**	**12**	**30**	**150**

In this study, out of 150 patients that presented with intracranial bleed, 108 patients (72%) presented to emergency with a GCS of more than 8 while 33 patients (22%) had a GCS score of less than 8 and 9 patients (6%) presented with GCS of 8. The mean GCS on admission is 11.54±4.19. Table 4

Table 4: GCS on the admission of patients included in this study and its relation with mortality outome in spontaneous intracranial bleed

GCS	FREQUENCY	PERCENTAGE (%)
MORE THAN 8	108	72.0%
LESS THAN 8	33	22.0%
8	9	06.0%
TOTAL	**150**	**100%**

GCS	DISCHARGE	LAMA	EXPIRED	TOTAL
MORE THAN 8	90(83.33%)	16(14.81%)	2(1.85%)	108
LESS THAN 8	9(27.27%)	14(42.42%)	10(30.30%)	33
8	9(100%)	0	0	9
TOTAL	**108**	**30**	**12**	**150**

Out of 150 patients that presented to ED, 108 patients had GCS of more than 8 out of which 90 patients(83.33%) were discharged i.e. most of the patients with GCS of more than 8 were discharged. 33 patients presented with GCS less than 8 out of which 10 patients (30.30%)expired.

Out of the 150 patients included in this study, the ICH score could be calculated in 145 patients, 129 patients had an ICH score of 2 or less out of which 101 patients were discharged, and 16 patients had an ICH score of 3 or more and out of them, 8 patients expired. As the ICH score increases the outcome becomes poor as is demonstrated by the fact that no patient with an ICH score of 0 expired while there was 100% mortality with ICH scores of 5 and 6 **.** Table 5.

Table 5: ICH score of patients included in this study and its relation with mortality outcome in spontaneous intracranial bleed.

SCORE	DISCHARGE	EXPIRED	LAMA	TOTAL
0	45(88.2%)	0	6(11.7%)	51
1	37(82.22%)	1(2.22%)	7(15.55%)	45
2	19(57.57%)	2(6.06%)	12(36.36%)	33
3	6(60%)	3(30%)	1(10%)	10
4	1(33.33%)	2(66.67%)	0	3
5	0	2(100%)	0	2
6	0	1(100%)	0	1
TOTAL	**108**	**11**	**26**	**145**

The volume of bleed was calculated in 150 patients by the ABC/2 method. Out of the 125 patients that presented with a volume of bleed less than 30 cc, 99 patients were discharged while 2 expired i.e. majority of patients with a volume of bleed of less than 30 cc were discharged.

Out of the 25 patients that presented with a volume of bleed more than 30 cc 10 patients (40%) were expired i.e. majority of patients expired. Table 6.

Table 6: volume of bleed and relation with mortality outcome in patients with spontaneous intracranial bleed

VOL OF BLEED	DISCHARGE	LAMA	EXPIRED	TOTAL
<30cc	99 (79.2%)	24(19.2%)	2(1.6)	125
>30cc	9(36%)	6(24%)	10(40 %)	25
Total	**108**	**30**	**12**	**150**

Table 7 below shows the ICH score of patients included in this study and its relation with mortality outcome in spontaneous intracranial bleed. As per the study result, no patient with scores 0 died, whereas all patients with scores 5 and 6 died.

Table 7: ICH score of patients included in this study and its relation with mortality outcome in spontaneous intracranial bleed

Score	This study(expired%)	Hedge et al	Hemphill et al	Panchal et al	Ojha et al
0	0	7	0	0	16.7
1	2.22	16	13	10	0
2	6.06	33	26	53.84	30
3	30	62	72	71.42	57.2
4	66.66	95	94	100	62.5
5	100	50	100		100
6	**100**				**100**

Discussion

A total of 150 patients with intracerebral haemorrhage were included in this study. In this study no patient with scores 0 died, whereas all patients with scores 5 and 6 died. The present study results are supported by studies of Hemphill et al [3], Panchal et al [8] and Ojha et al [9] in which there was 100% mortality with an increase in score to 5 and 6. These all study findings are in line with the present study findings. [10]

Conclusion:

Intracranial haemorrhage is a life-threatening medical emergency, which can crush delicate brain tissue or limit its blood supply. The study result showed that male gender was more common in spontaneous intracranial bleed and elderly population is more prone to spontaneous intracranial bleed. Further the result showed GCS (<8) is a significant and independent predictor of mortality for spontaneous intracranial bleed. This study demonstrated an increase in the ICH score with an increase in mortality. Therefore, ICH score can be considered as a tool for mortality rate prediction for intracerebral haemorrhage patients.

Reference

1. Sutherland GR, Auer RN. Primary intracerebral hemorrhage. J Clin Neurosci. 2006 Jun;13(5):511-7.
2. Albers GW, Amarenco P, Easton JD, Sacco RL, Teal P. Antithrombotic and thrombolytic therapy for ischemic stroke:

American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). Chest 2008; 133:630S-69S

3. Hemphill JC, Bonovich DC, Besmertis L, Manley GT, Johnson SC. The ICH score: a simple, reliable grading scale for intracerebral hemorhage. Stroke 2001; 32:891-7.
4. Lisk DR, Pasteur W, Rhoades H, Putnam RD, Grotta JC. Early presentation of hemispheric intracerebral hemorrhage: prediction of outcome and guidelines for treatment allocation. Neurology 1994; 44:133-9.
5. van Asch CJJ, Luitse MJA, Rinkel GJE, van der Tweel I, Algra A, Klijn CJM. Incidence, case fatality, and functional outcome of intracerebral haemorrhage over time, according to age, sex, and ethnic origin: a systematic review and meta-analysis. Lancet Neurol 2010; 9:167-76
6. Zhang L-F, Yang J, Hong Z, et al. Proportion of different subtypes of stroke in China. Stroke 2003; 34:2091-6.
7. Hemphill JC, Farrant M, Neill TA, Jr. Prospective validation of the ICH Score for 12-month functional outcome. Neurology 2009; 73:1088-94.
8. Panchal et al. Intracerebral hemorrhage score and volume as an independent predictor of mortality in primary intracerebral hemorrhage patients. Indian J Surg 2015;77:302-4
9. Ojha et al; clinical profile of patients with acute intracerebral hemorrhage and ICH score as an outcome predictor on discharge,30 days and 60 days follow up, Volume 67
10. IJ O., J O. J., & U O. B. Evaluation of the Effectiveness of Intra-operative Low Dose Ketamine Infusion on Post-operative Pain Management Following Major Abdominal Gynaecological Surgeries. Journal of Medical Research and Health Sciences, 2022; 5(10): 2269–2277.