Original Research Paper

Volume - 13 | Issue - 03 | March - 2023 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Neurology

EVALUATION OF SERUM FERRITIN AS A PROGNOSTIC MARKER IN ACUTE HEMORRHAGIC STROKE

Dr. Rachakonda Srija* Postgraduate, Department of General Medicine, Mamata Medical College and Hospital, Khammam-507002, Telangana, India. *Corresponding Author

Dr. Rakesh Chettikrindi Postgraduate, Department of General Medicine, Mamata Medical College and Hospital, Khammam-507002, Telangana, India.

Dr. Ghugulothu Deepthi Postgraduate, Department of General Medicine, Mamata Medical College and Hospital, Khammam-507002, Telangana, India.

ABSTRACT **Background -** The term stroke or apoplexy refers to acute neurological injury,especially the type caused by cerebrovascular disease. Stroke is classified into two major types:

1. Infarction is due to thrombosis, embolism or systemic hypoperfusion. 2.Hemorrhage is through rupture of small arteries, arteriolar, aneurysms or capillaries.

Methods - All patients who were admitted with stroke in medical ward and ICU from January 2021 to July 2022 in the department of General Medicine, Mamata Medical College and Hospital, Khammam.This is a hospital based observational study in group of 50 subjects. **Results -** Among 50 subjects of 30-80 age group most patients are 60s to 70s

- Most frequent site of hematoma in study population is capsulogangionic region consistent with hypertensive hemorrhage (64%) , least affected thalamus (14%) .
- HTN is main risk factor (98%) for patients with ICH.
- Most common symptom FND
- Maximum mortality in age group is among 51-70years
- Serum ferritin levels are increased in mortality group
- Patients < 40 years, DM, Thalamic bleed have good prognosis.

Conclusions -The most common risk factor connected with ICH is hypertension. The volume of ICH and admitting GCS have no effect on serum ferritin levels.Increased baseline serum ferritin can be used as an independent prognostic marker and is associated with clinical deterioration.

1. Gangliocapsular region is the most common site of bleed.
2. The absence of diabetes, younger age and absence of IVH and midline shift are associated with good prognosis.
3. Low GCS and higher volume of hematoma is associated with poor prognosis.
4. The initial volume of hematoma as evaluated by ABC/2 is a reliable predictor of prognosis.

KEYWORDS : Stroke , Hypertension , Serum ferritin

Background

Wepfer (1620–95), the Swiss physician was the first to identify Intracerebral hemorrhage and later elaborated by Morgagni (1682–1771) in detail. Stroke is one of the leading causes of death and disability in India with an incidence rate of 119-145/100,000 population. Prevalence 55.6 per 100,000 all ages (4);0.63 Million deaths (5) ;1.441.64;million cases of new acute strokes every year (6.);6,398,000 DALYs (7.).12% of strokes occur in the population aged <40 years (8).28-30 day case fatality ranges from 18-41% (9, 10,11) .The consequence of CVA is devastating. In addition to the functions specific to the lost brain tissue, other essential mental faculties such as humor, mood, initiative, and speed of thought are severely affected. Sadly these attributes are ignored in the management of stroke patients.

Materials and Methods

We conducted the study in the department of general Medicine Mamata General Hospital, Mamata Medical College, Khammam from January 2021 to July 2022 .

Study Design

This was a hospital based observational study.

Sample Profile

A group of 50 subjects participated in this study.

Inclusion criteria for study patients

First episode of Primary supratentorial hemorrhage diagnosed clinically and by computed tomography of brain.

Exclusion criteria for study patients

1. Ischemic stroke.
2. Anemia.
3. Severe alcohol consumption.
4. Chronic liver disease.
5. Chronic kidney disease.
6. Hematological cancer.
7. Secondary intracerebral hemorrhage.

Results

No of subjects: 50

The most frequent site of hematoma in the study population is gangliocapsular region and is most consistent with the site of hypertensive hemorrhage(64%). The thalamus is least affected in the study(14%).

LOCATION OF HEMATOMA IN STUDY POPULATION:

Location	No of cases	%
Lobar	11	22
Gangliocapsular	32	64
Thalamus	7	14

SERUM FERRITIN LEVELS IN THE MORTALITY GROUP:

Sr.ferritin(ng/ml)	Frequency	Percentage
<200	0	0
200-300	2	13.33
300-400	9	60.00
>400	4	26.66

Serum ferritin is remarkably increased in mortality group with MRS=6. The mean Sr.ferritin level is 363.4 ng/ml(SD 46.14) with statistical significance i.e;P<0.05.

As a whole,
Mean ICH volume=78.66ml.Mean serum ferritin level=363.40 ng/ml
In subjects with good prognosis,
Mean ICH volume = 24.12 ml
Mean serum ferritin level = 111 ng/ml.

In subjects with poor prognosis, Mean ICH volume = 59.48 ml

Mean serum ferritin level = 265.11 ng/ml. In mortality group, Mean ICH volume= 78.66 ml.

Mean serum ferritin level = 363.40 ng/ml.

DISCUSSION

This study was conducted on 50 patients with acute intracerebral hemorrhage to find out the serum ferritin levels and correlation between different prognostic groups.

In the previous studies by William Whitely et al (128), the other variables associated with poor outcome include, body temperature, blood glucose, C-RP, WBC , serum cortisol , elevated plasma and CSF levels of glutamate, glycine and IL-6.

It is likely that the inflammatory response is triggered by stroke process and mediated by IL-1 (fever) and IL-6 / TNF with rise in acute phase reactants such as C-RP etc that may enhance neurotoxicity. However the initial rise in serum ferritin levels at the onset of stroke is not associated with inflammatory response and correlate with the body iron stores. In the study by Natalia Perez et al, it has been proved that the serum ferritin levels are not correlated with other markers of inflammatory response (49). It is again confirmed by Armengolu et al (50). In addition study by Natalia Perez et al, concluded that older age,higher stroke severity, large volume of hematoma with intraventricular extension and mass effect are associated with poor outcome whichcorrelates with this study. High serum ferritin levels are independently associated with poor outcome in patients with ICH which suggest neurotoxic effect of increased body iron stores.

Base line serum ferritin levels correlated with initial ICH and edema volume and to a lesser extent with ICH growth.

Antonio Davlos et al has also proved association between increased body iron stores as measured by serum ferritin and clinical detoriation of acute cerebral infarction.

OUTCOME

The overall mortality is 30 % in this study population. Males had higher mortality (34.28%) than that of females (20%). This is also higher than the reported mortality rate of 10 – 20 % among developed countries. In part it can be explained by lack of long term care facilities in most part of India and associated complications of immobilization. The average mortality rate reported by Das et.al is 18 -41 % in India (9, 10).

The high mortality occurs in age group of 51 – 70 years in this study population (66.66 %). Ten out of thirty patients in this age group died due to ICH.

Acknowledgements
Nil

Declaration of Interest
The authors report no conflict of interests

Funding
Nil

REFERENCES

1. Dalal P,Bhattacharjee M, Vairale J, Bhat P. UN millennium development goals: can we halt the stroke epidemic in India? Ann Indian AcadNeurol 2007; 10: 130-6
2. WorldHealthOrganisation.PreventingChronicDiseases:Avitali nvestment.Geneva, Switzerland. 2005.
3. Murthy J. Thrombolysis for stroke in India: Miles to go..... Neurology India 2007; 55 (1) 3-5
4. World Health Organisation.Measurement in health. Statistics Tables 2009
5. Shah B, Mathur P. Workshop Report on Stroke Surveillance in India. Division of Noncommunicable Diseases, Indian Council of Medical Research, New Delhi 2006.
6. Das S et al. A prospective community based study of stroke in Kolkota, India. Stroke 2007; 38: 906-10
7. Feigin VL, et al. (2003). Stroke epidemiology: a review of population-based studies of incidence, prevalence, and case-fatality in the late 20th century
8. Bank Policy Research Working Paper 3669; 2005 Das S, Banerjee T. Stroke Indian Scenario. Circulation 2008; 118: 2719-24 Ghamija
9. Lukin JA, Ho C: The structure-function relationship of hemoglobin in solution at atomic resolution. Chem Rev 2004;104:1219.
10. Emerit, J., C. Beaumont, and F. Trivin. "Iron metabolism, free radicals, and oxidative injury." Biomedicine & pharmacotherapy 55.6 (2001): 333-339.