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SERUM ALBUMIN IN ACUTE INTRACEREBRAL HEMORRHAGE

Internal Medicine

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ABSTRACT

Background: Previous studies has linked blood albumin levels to stroke outcome, with higher levels indicating a better result in stroke patients. However, many of these research have been conducted on acute ischemic stroke, and information on hemorrhagic stroke is limited. The purpose of this study was to investigate albumin levels in hemorrhagic stroke patients at tertiary care centre in northern India. **Materials & Methods:** Fifty six patients with acute ICH were included in the study. All participants were evaluated by history, examination, laboratory and radiological modalities. Blood samples serum albumin were collected at the time of admission. Stroke severity was assessed using NIHSS and GCS at the time of admission. Functional outcome was measured at 1 week and after 3 months using modified Rankin scale (mRs). Statistical analysis and interpretation of the data was done by using SPSS Software version 23. **Result:** A total of 56 patients with Intracerebral hemorrhage (ICH) were included in this study. Mean (SD) age was 62.07. Among the study population, 31(55.4%) were male and 25 (44.6%) were female. Hypertension was present in 89.3% of the patients and 32.1% of the patients were diabetic. The mean S. Albumin (g/dL) was 3.27. There was a moderate negative correlation between mRS (Day 7) and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.53, p = 0.005). **Conclusion:** Patients with decreased blood albumin level had a worse prognosis at one week but had no effect on outcome at three months.

KEYWORDS

ICH, albumin, mRS

INTRODUCTION

Multiple injury mechanisms has been implicated in acute ICH including perilesional edema and blood–brain barrier (BBB) disruption,[1] oxidative injury and inflammation,[2,3] excitotoxicity[4], and apoptosis[5]. Albumin is known to antagonise these mechanisms[6,7,8,9]. This study was carried out to estimate the serum albumin level in acute ICH and to correlate with its outcome.

MATERIAL AND METHOD

This prospective observational study was done at Department of Medicine MSD Medical College Bahraich over a period of 12 months. After obtaining informed consent 56 patients with acute hemorrhagic stroke who were above 18 years with no evidence of chronic liver disease,nephrotic syndrome,diabetic kidney disease and malignancy were included in the study. Institutional Ethics Committee approved the study. Diagnosis of stroke was based on clinical observation and radiological imaging. Blood samples for assessment of albumin was collected at admission within 36 hours after stroke onset. Stroke severity at presentation was determined by NIHSS and GCS score. Modified Rankin scale (mRS) was used to assess functional outcome at 1 week and after 3 months. The data was entered in MS EXCEL spreadsheet and analysis was done using software SPSS Version 23.

RESULT

A total of 56 patients with Intracerebral hemorrhage (ICH) were included in this study. Mean (SD) age was 62.07. Among the study population, 31(55.4%) were male and 25 (44.6%) were female. Hypertension was present in 89.3% of the patients and 32.1% of the patients were diabetic. The mean S. Albumin (g/dL) was 3.27. There was a moderate negative correlation between mRS (Day 7) and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.53, p = 0.005).The mean (SD) of NIHSS was 32.14 The mean (SD) of GCS was 7.59.The mean (SD) of mRS was 4.86.The mean (SD) of mRS was 4.08.

The mean (SD) of mRS was 3.61.There was a moderate negative correlation between NIHSS and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.34, p = 0.010). For every 1 unit increase in NIHSS (Day 1), the S. albumin (g/dL) decreases by 0.04 units.There was a moderate positive correlation between GCS and S. albumin (g/dL), and this correlation was statistically significant (rho = 0.4, p = 0.002). For every 1 unit increase in GCS, the S. albumin (g/dL) increases by 0.14 units. There was a moderate negative correlation between mRS(Day 1) and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.32, p = 0.016). For every 1 unit increase in mRS, the S. albumin (g/dL) decreases by 0.49 units.There was a moderate negative correlation between mRS (Day 7) and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.53, p = 0.005). For every 1 unit increase in mRS (Day 7), the S. albumin (g/dL) decreases by 0.52 Units.There was a weak negative correlation between mRS (Day 90) and S. albumin (g/dL), and this correlation was not statistically significant (rho = -0.06, p = 0.824).

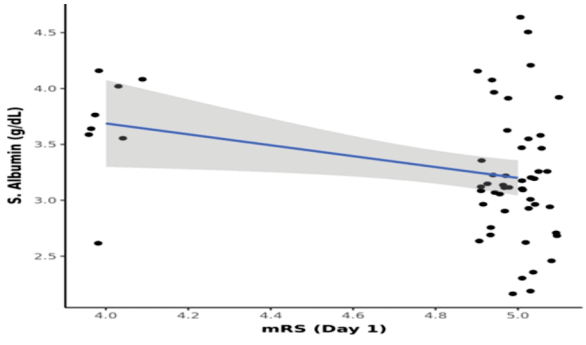

Fig.1: The above scatterplot depicts the correlation between mRS (Day 1) and S.albumin (g/dL).There was a moderate negative correlation between mRS and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.32, p = 0.016). For every 1 unit increase in mRS, the S. albumin (g/dL) decreases by 0.49 units.

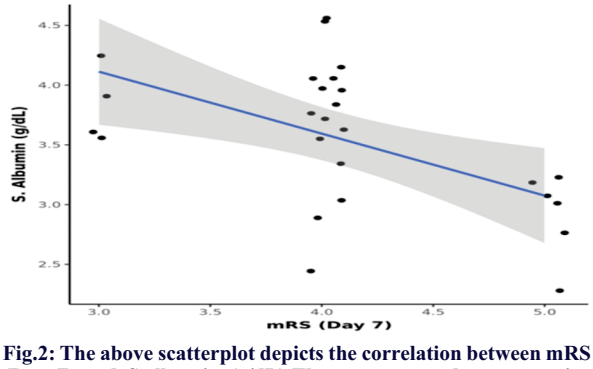

Fig.2: The above scatterplot depicts the correlation between mRS (Day 7) and S.albumin (g/dL).There was a moderate negative correlation between mRS and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.53, p = 0.005). For every 1 unit increase in mRS, the S. albumin (g/dL) decreases by 0.52 Units.

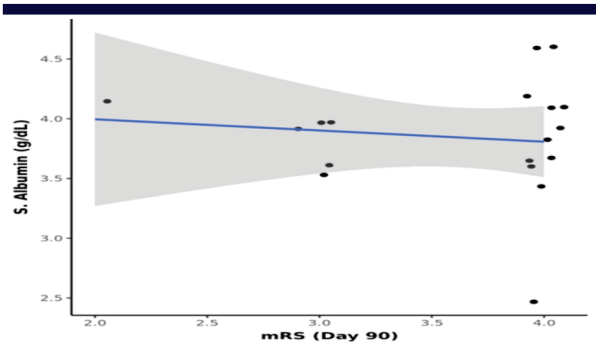

Fig.3: The above scatterplot depicts the correlation between mRS (Day 90) and S.albumin (g/dL).There was a weak negative correlation between mRS and S. albumin (g/dL), and this correlation was not statistically significant (rho = -0.06, p = 0.824).

DISCUSSION

In preclinical studies, albumin has been shown to be neuroprotective through a number of mechanisms, including the reduction of hematocrit levels, reduction of infarction volume, antioxidant effect, protection of the blood-brain barrier[10], and the inhibition of leukocyte adhesion and stagnation in postcapillary microcirculation[11]. Morotti A et al. [12] study reported that hypoalbuminaemia patients had a lower GCS at presentation and a higher frequency of IVH and correlated with poor outcome in ICH patients. Study done by Di Napoli M et al[13] demonstrated that hypoalbuminemia does not predicts a poor discharge outcome. Our study showed moderate positive correlation between GCS and S. albumin which is in line with the previous study. In contrast to the study done by Di Napoli M et al, our study showed a moderate negative correlation between mRS on day 7 and S. albumin and a weak negative correlation between mRS on day 90 and S. albumin.

CONCLUSION

Patients with decreased blood albumin level had a worse prognosis at one week but had no effect on outcome at three months.

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