Original Research Paper

Internal Medicine

ALBUMIN IN ACUTE ISCHAEMIC STROKE

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ABSTRACT **Background:** Serum albumin has been correlated with stroke outcome and has shown that elevated levels of serum albumin has better outcome in stroke patients. This study was done to assess albumin level in acute ischemic stroke patients at tertiary center in north India. **Materials & Methods:** Ninety four patients with acute stroke were included in the study. All participants were evaluated by history, examination, laboratory and radiological modalities. Blood samples for assessment of albumin was collected at the time of admission. NIHSS and GCS scoring was done to assess Stroke severity at the time of admission. modified Rankin scale (mRs) scoring was done to assess the Functional outcome at 1 week and after 3 months of stroke onset. Statistical analysis and interpretation of the data was done by using SPSS Software version 23. **Result:** Among 94 patients included in the study, Mean (SD) age was 65years, 71(75.5%) were male and 23 (24.5%) were female. Hypertension was present in 52(55.3%) of the patients and 57.(60.6%) of the patients were diabetic The mean S. Albumin (g/dL) was 3.40. There was moderate negative correlation between serum albumin level and mRS score at 1 week (rho = -0.48, p = <0.001). At three months there was no correlation (rho = -0.12, p = 0.287). **Conclusion:** Patients with higher serum albumin level had better outcome at one week but had similar outcome at 3 month.

KEYWORDS : Albumin, Stroke mRS.

INTRODUCTION

Stroke is a major global health problem, and it is the second leading cause of death and the third leading cause of disability globally[1, 2]. Perilesional edema and blood–brain barrier (BBB) disruption,[3] oxidative injury and inflammation, 4,5 excitotoxicity[6], and apoptosis[7] are all common injury mechanisms. Many of these mechanisms are known to be inhibited by albumin therapy, which directly protects both parenchymal and vascular elements of the brain.[8,9,10,11.]

AIMS AND OBJECTIVES

• To determine the level of serum albumin in acute ischaemic stroke.
• To study its correlation with clinical outcome.

MATERIAL AND METHOD

This prospective observational study was conducted at Department of Medicine Maharaja Suhel Dev Medical College over a period of 12 months. After obtaining informed consent, Ninety four patients of age above 18 years, both male and female with clinical and radiological evidence of acute Ischemic were included in the study. Intracranial hemorrhage, Chronic Liver disease, Nephrotic syndrome, Diabetic nephropathy, Malignancies were excluded from 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. NIHSS and GCS score were used to assess Stroke severity at presentation. Functional outcome was measured using modified Rankin scale at 1 week and after 3 months of stroke onset. Institutional Ethics Committee approved the study. The data was entered in MS EXCEL spreadsheet and analysis was done using software SPSS Version 23.

OBSERVATION

Among 94 patients included in the study, Mean (SD) age was 65years, 71(75.5%) were male and 23 (24.5%) were female. Hypertension was present in 52(55.3%) of the patients and 57.(60.6%) of the patients were diabetic The mean S. Albumin (g/dL) was 3.40. 48.9% had S. albumin <3.5 g/dL and 51.1% had S. albumin ≥3.5 g/dL. The mean (SD) of NIHSS was 28.06 (5.69). There was a moderate negative correlation between NIHSS and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.56, p = <0.001).The mean (SD) of GCS was 9.28 (2.04).There was a moderate positive correlation between GCS and S. albumin (g/dL), and this correlation was statistically significant (rho = 0.5, p = <0.001).

The mean (SD) of mRS (Day 1) was 4.59 (0.58).There was a weak negative correlation between mRS (Day 1) and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.27, p = 0.008).The mean (SD) of mRS (Day 7) was 3.82 (0.65).There was a moderate negative correlation between mRS (Day 7) and S. albumin (g/dL), and this correlation was statistically significant (rho = -0.46, p = <0.001).The mean (SD) of mRS (Day 90) was 3.09 (0.61).There was a weak negative correlation between mRS (Day 90) and S. albumin (g/dL), and this correlation was not statistically significant (rho = -0.08, p = 0.538).
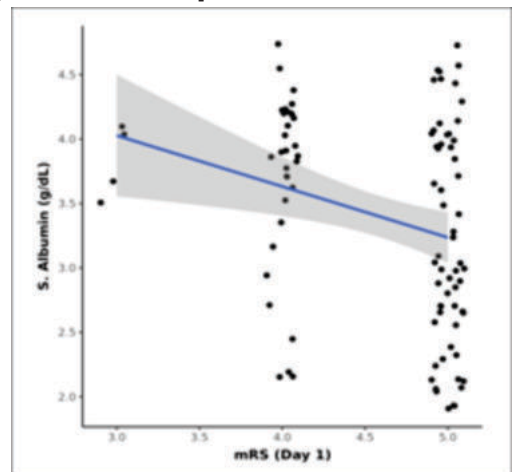

Fig.1: The above scatterplot depicts the correlation between mRS (Day 1) and S. albumin (g/dL). Individual points represent individual cases. The blue trendline represents the general trend of correlation between the two variables. The shaded grey area represents the 95% confidence interval of this trendline.
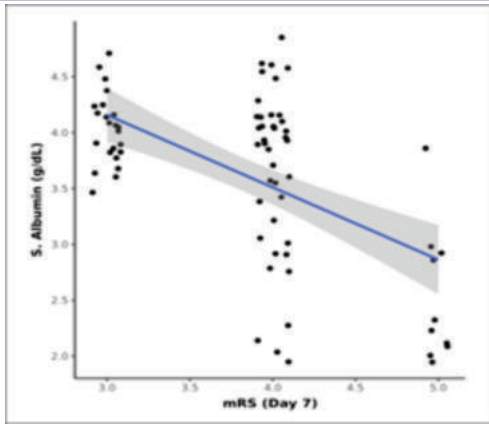
Fig. 2: The above scatterplot depicts the correlation between mRS (Day 7) and S. albumin (g/dL). Individual points represent individual cases. The blue trendline represents the general trend of correlation between the two variables. The shaded grey area represents the 95% confidence interval of this trendline.

Fig. 3: The above scatterplot depicts the correlation between mRS (Day 90) and S. albumin (g/dL). Individual points represent individual cases. The blue trendline represents the general trend of correlation between the two variables. The shaded grey area represents the 95% confidence interval of this trendline.
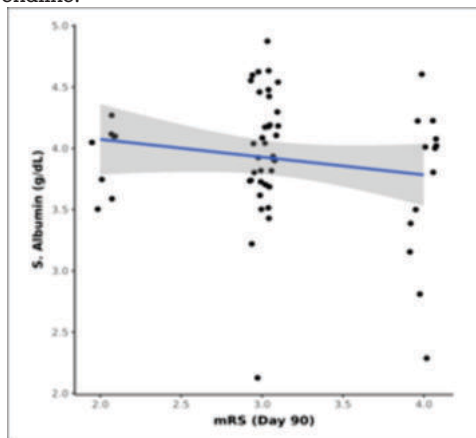
DISCUSSION

Hypoalbuminaemia appears to be a predictor of poor prognosis in different clinical settings[12]. Albumin has shown to be neuroprotective in preclinical studies by variety of mechanisms including decrease volume of infarction, brain swelling primarily by reducing hematocrit level, direct vascular endothelial effect, antioxidant effect, blood -brain barrier protectant[13] inhibit stagnation, thrombosis, and leukocyte adhesion in postcapillary microcirculation[14.]

Present study demonstrate the moderate negative correlation between serum albumin level and NIHSS score. Idicula TT et al. [15] study showed that the median NIHSS score on admission was 4 (1– 8) and reported that lower NIHSS score on admission were independently associated with a better outcome. Cho YM et al. [16] reported that initial NIHSS score correlated with the functional outcome. Kasundra G et al. [17] showed that patients with higher NIHSS score had a lower serum albumin level and had a poor outcome. Findings in our study were consistent with the above studies.

This present study showed moderate positive correlation between serum albumin level and GCS score. Ranjan AK et al.[18] demonstrated that serum albumin had a weak correlation with GCS score in patients with ischemic stroke with R square 0.360.

This study shows moderate negative correlation between serum albumin level and mRS score at 1 week. But there was no correlation observed at three months. Dash PK et al.[19] showed that patients with low mRS and high albumin had better outcome and follow up serum albumin level (g/dL) at 1 week (3.8±0.25) and at 3 months (3.7±0.23) was associated with poor outcome. Idicula TT et al. [15] study showed that the median mRS score on day 7 was 2 (1–3) and was significantly associated with good outcome and lower mortality. Our observation is in line with the above studies that low mRS score associated with higher serum albumin level and better outcome at 1 week but did not show significant difference at 3 month.

CONCLUSION:

Patients with higher serum albumin level had better outcome at one week but had similar outcome at 3 month.

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