



TO STUDY THE CORRELATION BETWEEN SERUM ALBUMIN LEVEL AND OUTCOME IN PATIENTS ADMITTED WITH ACUTE ISCHEMIC STROKE

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**ABSTRACT**

**Background** Stroke is becoming an important cause of premature death and disability in low- income and middle-income countries like India, largely driven by demographic changes and enhanced by the increasing prevalence of the key modifiable risk factors. Despite early initiation of treatment protocols, there may be long lasting debilitating sequel. Therefore, there has been a search for neuroprotective agents which might improve the prognosis of stroke. **Methods** Study was conducted at MGM Medical College and Hospital, Navi-Mumbai where in 75 patients admitted with acute ischemic stroke selected for the study. Proper consent was taken from the patients after checking the inclusion criteria. Their serum albumin levels were checked at the time of admission and discharge and Modified Rankin score was calculated to assess functional status. **Results** The mean serum albumin levels at the time of admission was  $3.86 \pm 0.49$  g/dL and the mean serum albumin levels at discharge were  $3.95 \pm 0.47$  g/dL. Approximately 73.32% of the cases had MRS score up to 3 had serum albumin levels of 4.0 to 4.49 g/dL and 27% had MRS score more than 3 had albumin level  $3 - 3.99$  g/dL. **Conclusion** It is concluded that low serum albumin levels are associated with poor functional outcomes as reflected by an increase in MRS score. Thus, in general, low serum albumin levels are associated with worse functional outcomes.

**KEYWORDS :** Serum albumin & Acute Stroke.

**INTRODUCTION**

Stroke is becoming an important cause of premature death and disability in low- income and middle-income countries like India, largely driven by demographic changes and enhanced by the increasing prevalence of the key modifiable risk factors. As a result developing countries are exposed to a double burden of both communicable and non-communicable diseases. The poor are increasingly affected by stroke, because of both the changing population exposures to risk factors and, most tragically, not being able to afford the high cost for stroke care. Majority of stroke survivors continue to live with disabilities, and the costs of on-going rehabilitation and long term-care are largely undertaken by family members, which impoverish their families.<sup>1,2</sup> Studies in the past have shown that there are various risk factors for stroke and these factors also influence the death rate among the stroke patients. Identification of such factors is very important considering the fact that proper timely measures can be taken for the patient's faster recovery.

Despite early initiation of treatment protocols, there may be long lasting debilitating sequel. Therefore, there has been a search for neuroprotective agents which might improve the prognosis of stroke. One such recently recognized agent is serum albumin. Therefore, the present study was conducted in order to study the association between serum albumin levels and acute stroke patients.

**OBJECTIVES**

1. To find out the association between serum albumin level at admission and the functional outcome of Acute Ischemic Stroke after 7 days.

**METHODS**

A prospective, observational study is conducted at MGM Medical College and Hospital, Navi Mumbai, department of Medicine. After checking the inclusion and exclusion criteria, total 75 patients with acute stroke selected for the study after taking their consent.

**Inclusion criteria:**

1. Patients diagnosed with Acute Ischemic Stroke.
2. Patients between 25 to 70 years of age.

3. Both male and female were included in the study.

**Exclusion criteria:**

1. Stroke history of patients were excluded.
2. Such patients those who presented after 24 hrs after onset of symptoms were excluded.
3. Haemorrhagic stroke patients were also excluded.
4. Fever, infections, diabetes and malignancies were excluded.
5. Patients having stroke due to tuberculoma, tumour or trauma
6. Subarachnoid haemorrhage
7. Patients with renal or hepatic disease
8. Also where consent was not given by the patient or relatives were excluded.

The functional status was assessed using Modified Rankin Scale (MRS) as follows:

**Table 1: Modified Rankin Scale (MRS)**

Score 0	No symptoms
Score 1	No significant disability. Able to carry out all usual activities, despite some symptoms
Score 2	Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities
Score 3	Moderate disability. Requires some help, but able to walk unassisted
Score 4	Moderately severe disability. Unable to attend to own bodily needs without assistance, and unable to walk unassisted
Score 5	Severe disability. Requires constant nursing care and attention, bedridden, incontinent
Score 6	Dead

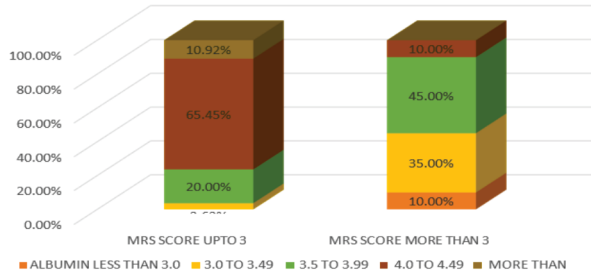
**RESULTS**

The data was analysed using statistical software (IBM SPSS).

**Table 2: Distribution of the MRS score according to the serum albumin levels in the study population**

PARAMETER	UPTO 3	MORE THAN 3	TOTAL
SERUM ALBUMIN LESS THAN 3.0	0 (0%)	2 (2.67%)	2 (2.67%)

3.0 TO 3.49	2 (2.67%)	7 (9.33%)	9 (12%)
3.5 TO 3.99	11 (14.67%)	9 (12%)	20 (26.67%)
4.0 TO 4.49	36 (48%)	2 (2.67%)	38 (50.67%)
MORE THAN 4.5	6 (8.00%)	0 (0%)	6 (8%)
TOTAL	55 (73.32%)	20 (26.69%)	75 (100%)
MEAN ± SD	4.12 ± 0.30	3.47 ± 0.52	3.95 ± 0.47
P VALUE	<0.001*		
SIGNIFICANCE	Statistically Significant		



**Figure 1 : Correlation of the MRS score with serum albumin at one week of admission**

SCORE	CORRELATION COEFFICIENT (R)	P VALUE	INTERPRETATION
MRS	-0.71	<0.001*	Strongly Negative

Serum albumin levels showed significant strongly negative correlation with MRS score; P value: less than 0.001.

**RESULT AND DISCUSSION**

In the present study, the mean serum albumin levels at the time of admission was 3.86 ± 0.49 g/dL and the mean serum albumin levels at discharge were 3.95 ± 0.47 g/dL. When assessed with age, there was no significant variation in the serum albumin levels at admission and discharge; P value: more than 0.50. In the study by Manickam S. et al<sup>3</sup>, the mean serum albumin levels were 3.85 g/dL. This was similar to the present study.

In the present study, it was observed that 73.32% of the cases had MRS score up to 3 (indicating less disability and good recovery) while 26.69% of the cases had MRS score of more than 3 (indicating more severe disability and less recovery). When assessed according to the mean serum albumin level at one week, it was observed that in the cases having MRS score up to 3, majority of the cases (65.45%) had serum albumin levels of 4.0 to 4.49 g/dL while in the cases having MRS score of more than 3, 80% of the cases had serum albumin levels of 3.0 to 3.99 g/dL. It was also observed that in the cases having MRS score up to 3 had higher serum albumin levels (4.12 ± 0.30 g/dL) while those having MRS score of more than 3 had lower serum albumin levels (3.47 ± 0.52 g/dL); P value: less than 0.001. The MRS score and the serum albumin levels showed a strongly negative significant correlation (R= - 0.71, P value: less than 0.001). In the study by Sandeep F. et al<sup>4</sup>, they observed that MRS score showed strongly negative significant correlation with serum albumin levels (R= -0.774; P value: 0.0001). This was similar to the present study. In another study by Dash P. K. et al<sup>5</sup>, they also observed a significant negative correlation between MRS score and serum albumin levels (R= -0.410, P value: less than 0.0001). Similar results of negative correlation of MRS score with serum albumin was also found in the studies by Gudi J. G. et al<sup>6</sup>, Bielewicz J. et al<sup>7</sup> and Alvarez-Perez F.J. et al<sup>8</sup>.

**CONCLUSION**

It can be effectively concluded that low serum albumin levels are associated with poor functional outcomes as reflected by an increase in MRS score. Thus, in general, low serum albumin levels are associated with worse functional outcomes. It may be because of some of the beneficial effects of serum albumin, including the anti-thrombotic effects,

decreases leukocyte adherence, and endothelial stasis of cells<sup>10</sup>. These effects may result in early reperfusion phased of acute ischemic stroke.

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