



STUDY OF SERUM ALBUMIN LEVEL AS A PROGNOSTIC INDICATOR OF STROKE: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

Background: Identification of reliable and inexpensive prognostic biomarkers in acute ischemic stroke remains clinically important. Serum albumin possesses antioxidant, anti-inflammatory, and endothelial-protective properties that may influence neurological recovery. **Objective:** To determine whether admission serum albumin levels predict stroke severity and short- and intermediate-term functional outcomes in patients with acute ischemic stroke. **Materials and Methods:** This prospective observational study included 73 consecutive patients presenting within 72 hours of symptom onset. Stroke severity was assessed using the NIHSS, and functional outcome was evaluated using the Barthel Index at Day 7 and 3 months. Pearson correlation and one-way ANOVA were used for statistical analysis. A p-value <0.05 was considered statistically significant. **Results:** Mean admission serum albumin was 3.69 ± 0.72 g/dL. Albumin showed inverse correlation with NIHSS ($r = -0.247$, $p = 0.035$), strong positive correlation with Day-7 Barthel Index ($r = 0.73$, $p < 0.001$), and strong positive correlation with 3-month Barthel Index ($r = 0.83$, $p < 0.001$). Significant differences were observed across stroke severity and functional outcome categories ($p < 0.05$). **Conclusion:** Lower admission serum albumin levels are significantly associated with greater neurological deficit and poorer functional recovery. Serum albumin may serve as a practical and cost-effective prognostic biomarker in acute ischemic stroke.

KEYWORDS : Acute ischemic stroke, Serum albumin, Prognosis, NIHSS, Functional outcome

INTRODUCTION

Stroke is a leading cause of mortality and long-term disability worldwide. Early prognostic stratification remains essential despite advances in reperfusion therapy.

Serum albumin exerts antioxidant, anti-inflammatory, and endothelial-stabilizing effects and may reduce ischemic brain injury through improved microcirculatory flow and attenuation of oxidative stress.

This study aimed to assess the association between admission serum albumin levels and stroke severity and functional recovery.

MATERIALS AND METHODS

Prospective observational study conducted from March 2023 to August 2024 at a tertiary care center.

Seventy-three adult patients with radiologically confirmed acute ischemic stroke admitted within 72 hours were included. Exclusion criteria included chronic liver disease, nephrotic syndrome, malignancy, systemic inflammatory disorders, and severe infection.

Serum albumin was measured using the bromocresol green method. Statistical analysis included Pearson correlation and one-way ANOVA. $P < 0.05$ was considered significant.

RESULTS

Table 1: Baseline Clinical Parameters

Variable	Mean $\pm$ SD
Serum Albumin (g/dL)	3.69 ± 0.72
NIHSS Score	13.07 ± 5.22
Day-7 Barthel Index	40.41 ± 13.71
3-Month Barthel Index	69.30 ± 14.48

Mean age: 67.1 years.

Table 2: Correlation Analysis

Comparison	r	p-value
Albumin vs NIHSS	-0.247	0.035
Albumin vs Day-7 Barthel	0.73	<0.001

Albumin vs 3-Month Barthel	0.83	<0.001
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Table 3: ANOVA Findings

Outcome Category	F value	p-value
Day-7 Functional Groups	30.10	<0.001
3-Month Functional Groups	66.16	<0.001
NIHSS Severity Groups	3.958	0.012

DISCUSSION

Admission serum albumin showed significant association with stroke severity and functional outcome. Lower albumin levels were associated with greater neurological deficit and poorer recovery.

Possible mechanisms include antioxidant effects, endothelial stabilization, anti-inflammatory action, and maintenance of oncotic pressure.

LIMITATIONS

Single-center study, moderate sample size, absence of multivariate regression analysis, and lack of independent nutritional assessment.

CONCLUSION

Admission serum albumin level is significantly associated with stroke severity and functional recovery. It may serve as a practical and cost-effective prognostic biomarker.

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