ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 10 | October - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ROLE OF PREOPERATIVE SERUM ALBUMIN AS PREDICTOR OF POSTOPERATIVE MORBIDITY AND MORTALITY IN EMERGENCY LAPAROTOMY

General Surgery

Dr. Hardik Prajapati PG Resident, Department of General Surgery, RNT Medical College, Udaipur, Rajasthan, India
Dr. Minaxi Sharma Professor & Guide, Department of General Surgery, RNT Medical College, Udaipur, Rajasthan, India
Dr. Ankita Tanwar Department of General Surgery, RNT Medical College, Udaipur, Rajasthan, India
Dr. Prem Singh Jatav Department of General Surgery, RNT Medical College, Udaipur, Rajasthan, India

ABSTRACT

Background: Malnutrition is a major risk factor for adverse outcomes in surgical patients, and serum albumin has long been considered a simple, cost-effective biomarker. This study aimed to evaluate the predictive value of preoperative serum albumin levels for postoperative morbidity and mortality in patients undergoing emergency laparotomy. **Methods:** A prospective cross-sectional study was conducted at RNT Medical College, Udaipur, including 105 patients undergoing emergency laparotomy. Preoperative serum albumin levels were measured and correlated with postoperative complications including wound dehiscence, sepsis, surgical site infection, prolonged ileus, anastomotic leak, and mortality. **Results:** Of 105 patients, 60 (57.1%) developed complications. Patients with preoperative serum albumin ≤3 g/dl had significantly higher complication rates (73.1%) compared to those with >3 g/dl (28.9%) ($p<0.001$). Mortality was highest in patients with albumin ≤2.5 g/dl (29.7%) versus only 2.6% when >3.5 g/dl. Wound dehiscence (29.5%) and sepsis (25.7%) were the most common complications. Low serum albumin was an independent predictor of poor outcomes. **Conclusion:** Preoperative hypoalbuminemia is a strong predictor of postoperative morbidity and mortality in emergency laparotomy. Serum albumin should be included in preoperative assessment to identify high-risk patients who may benefit from early nutritional optimization.

KEYWORDS

INTRODUCTION

Malnutrition remains one of the most important risk factors influencing surgical outcomes. Up to 30% of surgical patients are malnourished, and hypoalbuminemia has consistently been associated with increased morbidity and mortality. Serum albumin, being inexpensive and widely available, serves as a reliable biomarker of nutritional status and systemic stress. Emergency laparotomy is associated with significant postoperative complications, and identifying risk predictors is essential for improving outcomes. This study aimed to assess the role of preoperative serum albumin as a predictor of morbidity and mortality in emergency laparotomy.

MATERIALS AND METHODS

Study Design: Prospective cross-sectional hospital-based study.
Setting: Department of General Surgery, RNT Medical College, Udaipur.
Sample Size: 105 patients undergoing emergency laparotomy.

Inclusion Criteria: All patients >12 years undergoing emergency laparotomy.
Exclusion Criteria: Patients with chronic liver disease, chronic renal disease, severe anemia (<7 g/dl), icterus, or those on steroids/ chemotherapy.

Methodology

Preoperative serum albumin levels were measured and patients were monitored for postoperative complications including surgical site infection (SSI), wound dehiscence, sepsis, anastomotic leak, ileus, enterocutaneous fistula, and mortality. Statistical analysis was performed using chi-square test.

RESULTS

Out of 105 patients, 60 (57.14%) developed postoperative complications, while 45 (42.86%) had uneventful recovery. Hypo-albuminemia was significantly associated with increased morbidity and mortality.

Patients with albumin ≤3 g/dl had a 73.1% complication rate compared to 28.9% when >3 g/dl ($p<0.001$).

Table 1 -Level of Serum Albumin and Postoperative Outcome

Sr. Albumin (g/dl)	Total no. of patients	Complications	No Complications	P value
Less than or equal to 3	67	49	18	P value - 0.0001 χ^2=14.34 df=1
>3	38	11	27	P value- 0.0094 χ^2=6.74 df=1

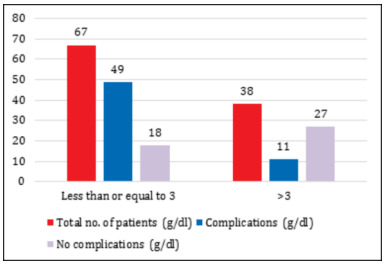

Figure -1

Mortality was highest (29.7%) in patients with albumin ≤2.5 g/dl, while mortality was only 2.6% when albumin >3.5 g/dl.

Table 2-Correlation of Postoperative Mortality with Serum Albumin Levels

Serum albumin levels	Mortality
Less than or equal to 2.5	11
Less than or equal to 3.0	4
Less than or equal to 3.5	2
More than 3.5	1

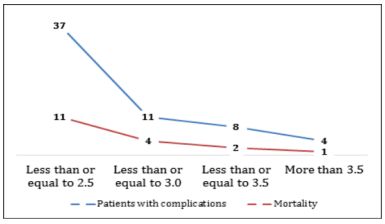

Figure-2

The most common complications were wound dehiscence (29.5%), sepsis (25.7%), and surgical site infection (21.9%).

Table -3 Post Operative Complications in Various Procedures

Complications	Yes	No	P value
Wound dehiscence	31	74	P value*=0.0001
Sepsis	27	78	P value*=0.0001
SSI	23	82	P value*=<0.001
A.I	21	84	P value*=0.001
C.I	25	80	P value*=<0.001
Others	9	96	P value*=<0.001

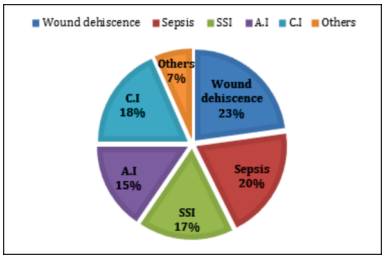

Figure -3

DISCUSSION

This study reinforces the role of serum albumin as an important prognostic marker in surgical patients. Our findings are consistent with previous studies which demonstrated that low albumin is associated with higher incidence of wound complications, sepsis, and mortality. Hypoalbuminemia reflects poor nutritional status, impaired immune function, and systemic inflammation, all of which contribute to adverse surgical outcomes. Preoperative optimization, including nutritional supplementation and albumin correction, may reduce morbidity.

CONCLUSION

Preoperative serum albumin is a simple, cost-effective, and reliable predictor of postoperative morbidity and mortality in emergency laparotomy. Patients with hypoalbuminemia should be identified early and considered for preoperative nutritional intervention whenever feasible to improve surgical outcomes.

Declaration

Conflict of Interest: The authors declare no conflict of interest.

Funding: None.

Ethical Approval: This study was approved by the Institutional Ethics Committee of RNT Medical College, Udaipur.

Author Contributions: Dr. Hardik Prajapati: Concept, data collection, analysis, manuscript drafting. Dr. Ankita Tanwar: Data collection, review of literature, editing. Dr. Minaxi Sharma: Study design, supervision, critical revision. Dr. Naresh Burdak: Statistical analysis, manuscript editing.

REFERENCES

1. Gibbs J, Cull W, Henderson W, Daley J, Hur K, Khuri SF. Preoperative serum albumin level as a predictor of operative mortality and morbidity. Arch Surg. 1999;134(1):36-42.
2. Kudsk KA, Tolley EA, DeWitt RC, et al. Preoperative albumin and surgical site infection. Am J Surg. 2003;185(1):37-43.
3. Detsky AS, McLaughlin JR, Baker JP, et al. What is subjective global assessment of nutritional status? JPEN. 1987;11(1):8-13.
4. Vincent JL, Dubois MJ, Navickis RJ, Wilkes MM. Hypoalbuminemia in acute illness: Is there a rationale for intervention? Ann Surg. 2003;237(3):319-334.
5. Engelman R, Adams DH, Byrne JG, et al. Impact of body mass index and albumin on outcomes in cardiac surgery. J Thorac Cardiovasc Surg. 1999;118(5):866-873.
6. Beghetto MG, Luft VC, Mello ED, Polanczyk CA. Nutritional assessment and prognosis in surgical patients. Nutrition. 2005;21(2):225-230.
7. Brown RO, Bradley JE, Bekemeyer WB, Luther RW. Hypoalbuminemia and clinical outcomes. J Parenter Enteral Nutr. 1989;13(6):532-536.
8. Arozullah AM, Daley J, Henderson WG, Khuri SF. Multifactorial risk index for postoperative respiratory failure. Ann Surg. 2000;232(2):242-253.
9. Palma S, Cosano A, et al. Serum albumin as a predictor of long-term outcomes in surgery. Eur J Clin Nutr. 2002;56:1031-1039.
10. Varut Lohsiriwat. Preoperative hypoalbuminemia and postoperative complications after rectal cancer surgery. World J Gastroenterol. 2009;15(32):4084-4090.
11. Liop G, et al. Serum albumin and parenteral nutrition outcomes. Clin Nutr. 2002;21(1):25-30.
12. Leite HP, et al. Serum albumin as predictor of outcomes in pediatric cardiac surgery. Nutrition. 2004;20(5):465-468.
13. Issangya C, et al. Perioperative albumin as predictor in abdominal surgery: A Tanzanian cohort. East Cent Afr J Surg. 2015;20(3):92-99.
14. Woods J, et al. Effect of albumin supplementation on outcomes after surgery. Ann Surg. 2001;233(5):665-672.
15. Chen Y, et al. Preoperative albumin predicts pulmonary complications after laparoscopic gastrectomy. World J Surg Oncol. 2015;13:300.
16. Kudsk KA, et al. Enteral versus parenteral feeding in malnourished surgical patients. Ann Surg. 1992;215(5):503-511.
17. Martin GS, Bernard GR. Hypoalbuminemia: marker or mediator of mortality? Crit Care Med. 2003;31(1):287-289.
18. Fleck A. Clinical and nutritional aspects of changes in acute-phase proteins during inflammation. Proc Nutr Soc. 1989;48(3):347-354.
19. Gatta A, Verardo A, Bolognesi M. Hypoalbuminemia: pathophysiology and clinical significance. J Clin Pathol. 2012;65(10):872-879.
20. Fuhrman MP. The albumin-nutrition connection: separating myth from fact. Nutrition. 2002;18(2):199-200.