



ROLE OF SERUM ALBUMIN IN PREOPERATIVE PERIOD TO PREDICT POSTOPERATIVE MORBIDITY IN ABDOMINAL SURGERIES

General Surgery

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ABSTRACT

Background: Serum albumin is a useful indicator of protein energy malnutrition, which may and may not be clinically apparent, but is linked to a significantly higher risk of morbidity and mortality. In this study, we assess the post-operative morbidity with relation to pre-operative albumin status, in patients undergoing emergency abdominal surgery. **Methods:** In this hospital based observational study, 50 patients undergoing emergency abdominal surgery at Mahatma Gandhi Medical College and Hospital were included. Hypoalbuminemia was diagnosed if serum albumin level was less than 3.5 gm/dl. Types of surgery and postoperative complications were included in the study. Any association between preoperative serum albumin level and postoperative morbidity was assessed. **Results:** Pre-operatively, 22 patients had hypoalbuminemia (serum albumin <3.5 g/dl) and 28 patients had normal albumin levels (≥ 3.5 g/dl). Out of 50 patients, 26 patients developed complications postoperatively. 16 patients out of 22 patients with hypoalbuminemia (with serum albumin <3.5 g/dl) had complications. 10 patients with normal albumin level had complications. Surgical site infection was found in 3 cases with albumin > 3.5 g/dl and 3 cases with less than 3.5 g/dl. Wound dehiscence was found in 4 case with > 3.5 g/dl serum albumin against 5 cases with less than 3.5 g/dl. Mean length of hospital stay was found to be higher in 6 patients i.e. 15 days in patients with hypoalbuminemia, compared to 1 patient with those having albumin level ≥ 3.5 g/dl. **Conclusions:** Preoperative albumin is a useful low-cost prognostic predictor for predicting surgery outcome.

KEYWORDS

Serum albumin, Emergency surgery, Morbidity

INTRODUCTION

Malnutrition is seen in roughly 35% of post operative with gastrointestinal illnesses, and up to 55% of those whose hospital stay was prolonged due to post-operative complications. There is adequate proof that patients with malnutrition have a increased risk of complications and death compared to individuals with adequate nutrition.

Initially, serum albumin was misconceived, and the importance of serum albumin in assessing a person's nutritional makeup was overlooked. Albumin, is a negative acute-phase protein. When there is subacute, acute illness or stress, a decrease in serum albumin occurs due to some changes in hepatic metabolism, and loss of albumin into the interstitium. It also shows an immediate response to surgical stress. Hence, it may meet the criteria for predicting a difficult post-operative course.

AIM

Aim of this study is to analyze the correlation between preoperative hypoalbuminemia and surgical complications encountered in patients undergoing emergency abdominal surgery.

METHODS

In this hospital based observational study, 50 patients undergoing emergency abdominal surgery at Mahatma Gandhi Medical College and Hospital were included. Data on type of surgery, post-operative complications were collected. Patients with no comorbidities who were admitted and operated within 24 hours were included in the study. The study period was between July 2022 to September 2022. Serum albumin level of 3.5 g/dl was considered the standard baseline in the study. 9 Serum albumin level was less than 3.5 gm/dl was considered as hypoalbuminemia. The relation between preoperative serum albumin level and postoperative morbidity was assessed.

Inclusion Criteria

The study population consisted of patients aged 18 years and above, admitted for either elective or emergency reasons and indicated for major abdominal surgery. All had consented for the study

Exclusion Criteria

It included: patients with chronic diseases like-patients having anemia with hemoglobin < 8 g/dl, liver failure, nephrotic syndrome, diabetic

patients; immunocompromised patients; femoral hernias; patients with associated head injury, orthopedic injury, renal injury, chest trauma; and patients who did not give consent to be included in the study.

Ethical clearance was obtained from the institutional ethics committee (human) of Mahatma Gandhi Medical College and hospital prior to the conduction of the study.

RESULTS

Total Of the 50 patients studied, 58% were male and 42% were female. Patients of age 18-60 were included in our study Pre-operatively, 22 patients had hypoalbuminemia (serum albumin < 3.5 g/dl) and 28 patients had normal albumin levels (≥ 3.5 g/dl). The mean preoperative serum albumin level of the patients included in the study was 3.26 g/dl with standard deviation (SD) of 0.57. We have divided the patients into 2 groups :- Group A (includes hypoalbumemia patients) and Group B (includes patients with normal albumin levels).

AGE	GROUP A	GROUP B
18-30	7	10
31-45	10	12
46-60	5	6

GROUP A (22 PATIENTS)	NO. OF PATIENTS
COMPLICATED	16
NON COMPLICATED	6

Out of 22 patients with hypoalbuminemia, 16 patients developed complications like Surgical site infection (SSI), wound dehiscence, anastomotic leak and long hospital stay (more than 15 days) and rest 6 patients developed no complications

GROUP B	NO. OF PATIENTS
COMPLICATED	10
NON-COMPLICATED	18

In Group B we included patients with normal albumin levels. Out of 28 patients of group B, 10 patients developed complication complications like Surgical site infection (SSI), wound dehiscence, anastomotic leak and long hospital stay (more than 15 days) and rest 18 patients developed no complications

SEX	GROUP A	GROUP B
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MALE	13	16
FEMALE	7	12

COMPLICATION	GROUP A	GROUP B
SURGICAL SITE INFECTION	4	3
WOUND DEHISCENCE	4	5
ANASTOMOTIC LEAK	2	1
LONG HOSPITAL STAY	6	1

In our study we observed , in Group A (Having 22 patients) 4 developed surgical site infection , 4 patients developed wound dehiscence , 2 patients developed anastomotic leak and 6 patients had long hospital stay of more than 15 days .

Whereas in Group B (having 28 patients) 3 developed surgical site infection , 5 patients developed wound dehiscence , 1 patient developed anastomotic leak and 1 patient had long hospital stay of more than 15 days .

DISCUSSION

Preoperative malnutrition has been an important risk factor for postoperative morbidity and mortality for over 75 years. Serum total protein (albumin and globulin) levels have long been connected to nutritional status in clinical practice.³

Hormones such as insulin and growth hormone are examples of factors that promote albumin synthesis. Pro-inflammatory mediators such as interleukin-6 (IL-6), interleukin-1 (IL-1), and tumor necrosis factor may inhibit albumin synthesis. Albumin make up 75% of the oncotic plasma pressure. Plasma albumin binds to free fatty acids, bilirubin, steroid hormones, calcium, and copper and transports them.⁶ It has been shown that the albumin-heme complex has a lipid antioxidant action.⁵ Albumin controls inflammation and minimize oxidative damage. Albumin is as a source of amino acids for tissue protein synthesis. Intraoperative levels of serum albumin have been shown to be powerful predictors of morbidity and mortality. Hypoalbuminemia was connected to poor tissue healing, reduced collagen production in surgical wounds , anastomoses, and impaired immunological response.⁸ Preoperative serum albumin levels contributes a critical role in determining a patient's postoperative outcome after major surgery.⁵

The most common indication for emergency abdominal surgery was interstinal perforation , followed by acute intestinal obstruction . In a study of 50 patients undergoing emergency exploratory laparotomy, it was found that 31 of the 50 patients had complications. Of these, the most commonly observed complication was wound dehiscence and sepsis. patients with complications had a mean preoperative albumin level of 2.78 g/dl . The preoperative albumin values were indirectly propotional with the length of hospital stay, whereas the reduction in albumin levels had a positive correlation with the length of hospital stay.

CONCLUSION

Preoperative albumin is a useful prognostic predictor for predicting surgical outcome, especially in emergency surgery. It is a simple-to use test. Post-operative morbidity in surgical patients could be decreased by assessing albumin levels in preoperative period, as hypoalbuminemia has adverse relation with surgical outcome. So, it is preferable to have normal albumin perioperatively.