



“Study on Relation between Preoperative Serum Albumin levels and Postoperative Outcome in Emergency Abdominal surgeries”

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Abstract

Major surgery triggers a systemic inflammatory response in the body, which includes a catabolic phase followed by anabolic phase for recovery from the post-operative phase, so the patient's nutritional status is critical. Several studies have shown that patients with poor nutritional status are at an increased risk of complications when compared to their counterparts. Serum albumin is a commonly used, basic test of nutrition status that is closely connected with the degree of malnutrition. Patients with hypoalbuminemia who have gastrointestinal tract surgery had a significantly increased poor postoperative outcome, according to prior research.

Keywords: NIL

Introduction

Major surgery triggers a systemic inflammatory response in the body, which includes a catabolic phase followed by anabolic phase for recovery from the post-operative phase, so the patient's nutritional status is critical. Several studies have shown that patients with poor nutritional status are at an increased risk of complications when compared to their counterparts. Serum albumin is a commonly used, basic test of nutrition status that is closely connected with the degree of malnutrition. Patients with hypoalbuminemia who have gastrointestinal tract surgery had a significantly increased poor postoperative outcome, according to prior research

Aims & Objectives:

This study intends to learn about the effects of Preoperative Serum albumin levels on postoperative outcomes.

To study Preoperative serum albumin levels in patients undergoing Emergency abdominal surgeries, their age and sex distribution in relation to the postoperative outcome of the patient in view of

postoperative period of stay, wound dehiscence, surgical site infection, anastomotic leak.

Methodology

Design of study: OBSERVATIONAL STUDY for a period of 18 years. This observational study will be conducted teaching from March 2022 to September 2023.

Population and Study subjects

Inclusion Criteria

All patients posted for Emergency abdominal surgeries in the Dept. of general surgery of Chettinad hospital and research institute.

Exclusion Criteria

1. Patients with age < 18yrs
 2. Patients with altered LFTs.
 3. Patients with DM.
 4. Patients with Chronic Kidney disease.
 5. Patients on Steroid treatment.
 6. Patients with seropositive status.
- c) Sample size: 30.

d) Sampling: Cases that attend the Department of General surgery.

e) Data collection: Using Pre tested semi structured questionnaire.

f) Study Variables: Age, Sex, Diagnosis, Surgery performed, Preoperative Serum albumin, Postoperative period of stay, wound dehiscence, surgical site infection, and anastomotic leak.

g) Data management and statistical plan for evaluating the results:

Data obtained is recorded in a predesigned pro forma.

Diagnosis is clinical and supported by Investigations in all cases.

Postoperative course and incidence and management of surgical complications, if any, were recorded.

Statistical analysis will be carried out and all the observations and results will be evaluated to arrive at a conclusion.

Results

The study was conducted on all patients who underwent emergency abdominal surgery in chettinad hospital and research institute. 30 patients were selected who met inclusion and exclusion criteria. Among 30 patients, 17 patients developed complications and 13 had uneventful recovery.

Table no 1: Age Distribution

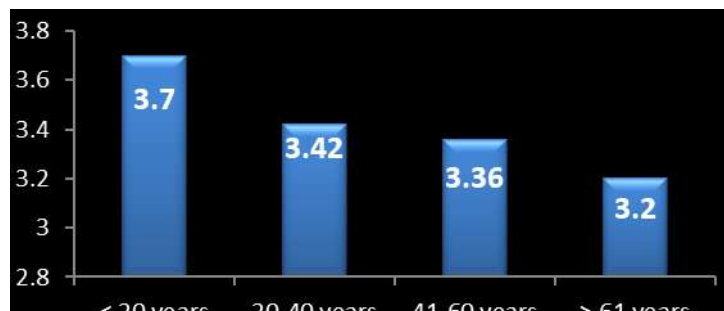
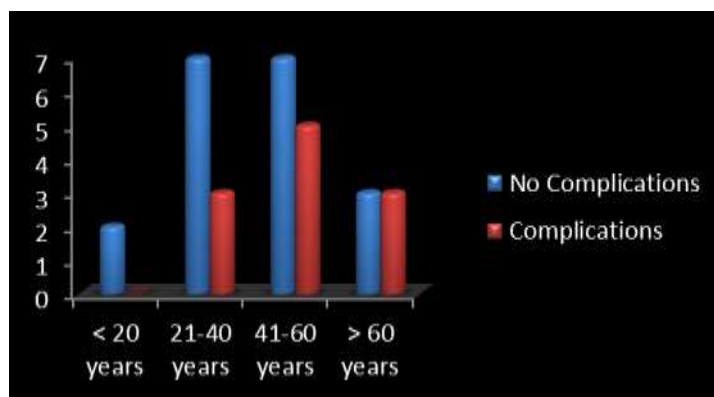
Age(yrs)	<20	21-40	41-60	>60
Total no	2	10	12	6
Male	1	8	8	5
Female	1	2	4	1

Graph 1: Age Distribution



Table no 2: Age group wise Mean Serum Albumin

Age Group	Mean Serum Albumin
< 20 years	3.7
21-40 Years	3.42
41-60 Years	3.36
> 60 years	3.2

Graph 2: Age group wise Mean Serum Albumin**Graph 3: Age group wise Complication rate****Table no 3: Gender Distribution**

Gender	Number	Percentage	Mean Serum albumin
Male	22	73.33	3.22 ± 0.546
Female	8	26.66	3.41 ± 0.327
Total	30	100	

Table no 4: Gender wise Complication Distribution

Gender	Complications	No Complication	Total number	Percentage of complications
Male	8	14	22	36.36 %
Female	3	5	8	37.50 %
Total	11	19	30	36.67%

Graph 4: Gender wise Complication Distribution

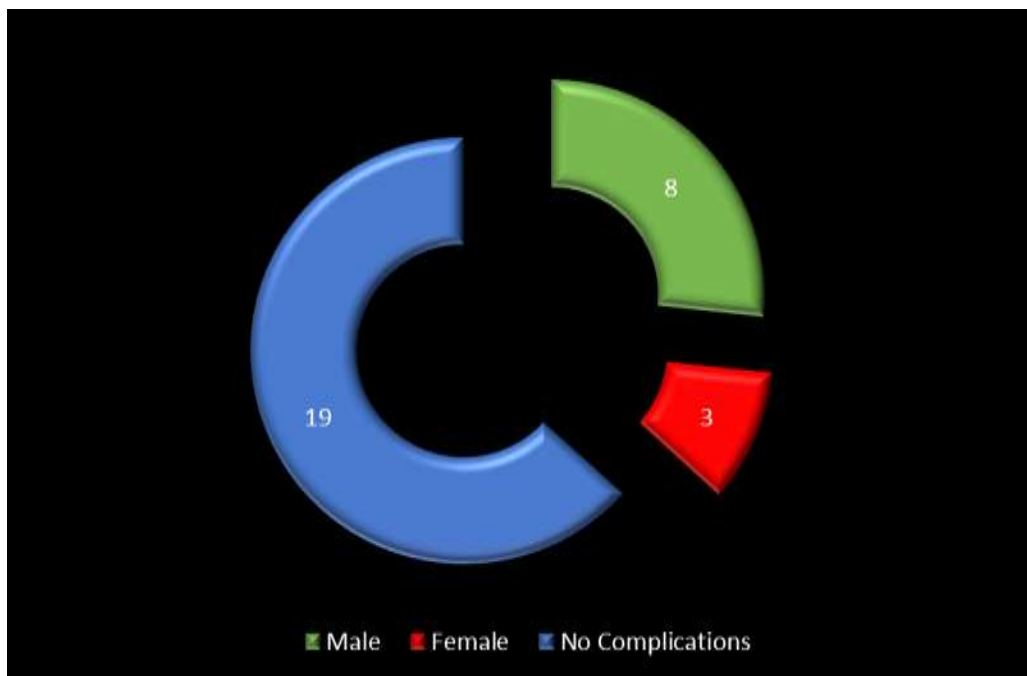


Table no 5: Indications for emergency laparotomy

Surgery	Number	Percentage
Perforated peptic ulcer	14	46.66%
Acute Intestinal obstruction	8	26.66%
Appendicular perforation	5	16.66%
Ruptured liver abscess	2	6.66%
Ceecal perforation	1	3.33%

Graph 5: Indications for emergency Laparotomy

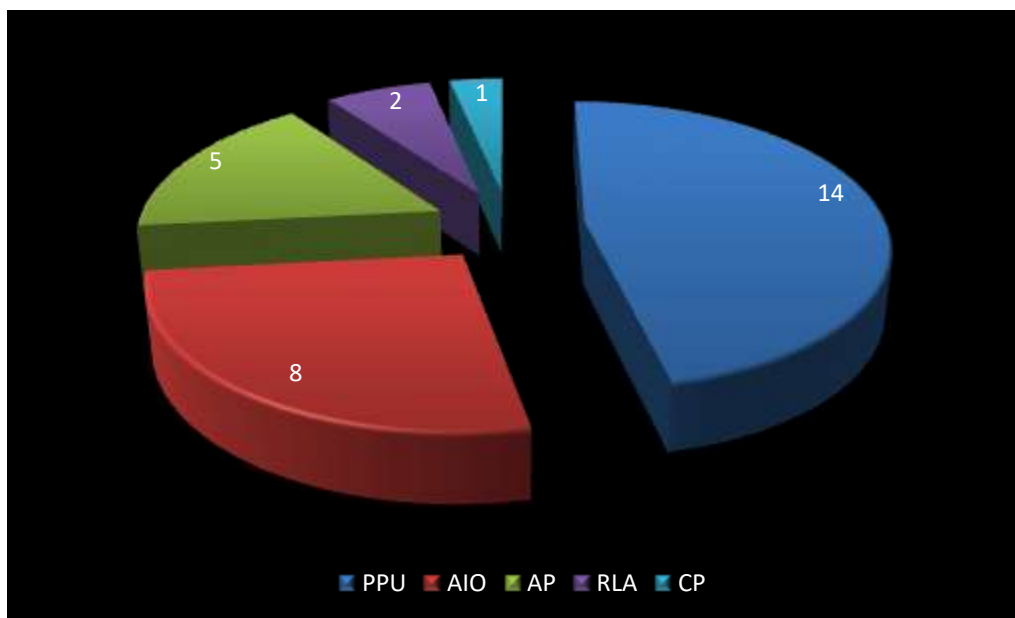


Table no 6: Post-operative outcomes

	No. of cases	Percentage (%)
Post op complications	11	36.66
No complications	19	63.34

Graph 6: Post-operative outcomes

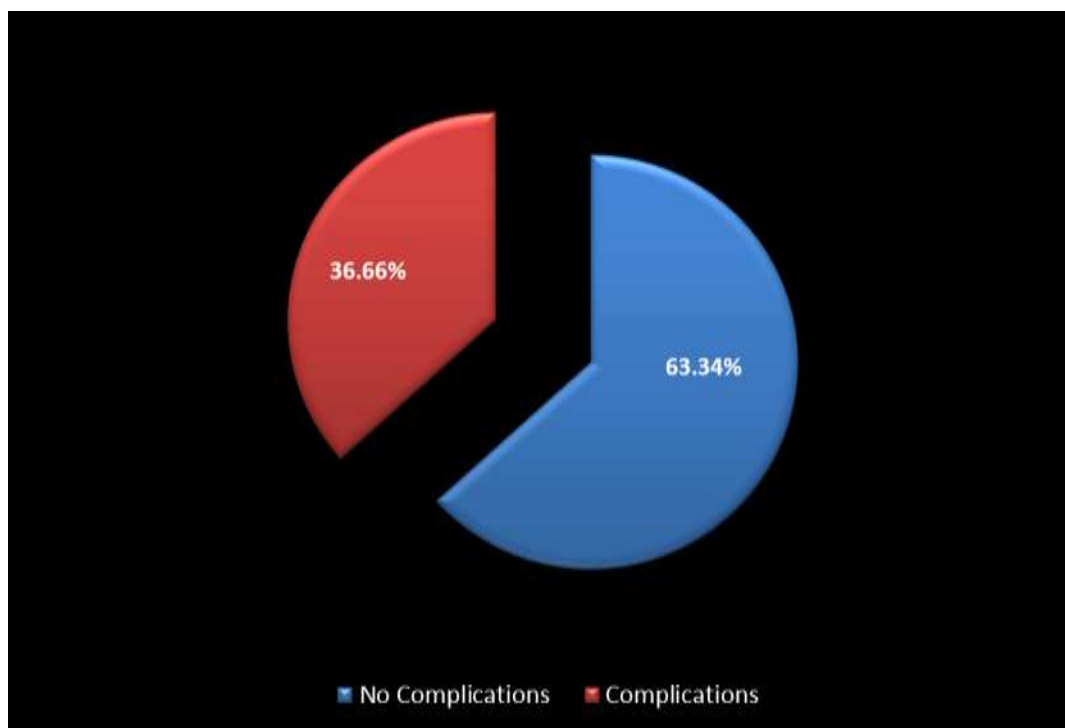


Table no 7: Surgery and Post-operative outcomes

Surgery	Total cases	Postoperative complications
Perforated peptic ulcer	14	5
Acute Intestinal obstruction	8	3
Appendicular perforation	5	1
Ruptured liver abscess	2	1
Ceecal perforation	1	1

Graph 7: Surgery and Post-operative outcomes

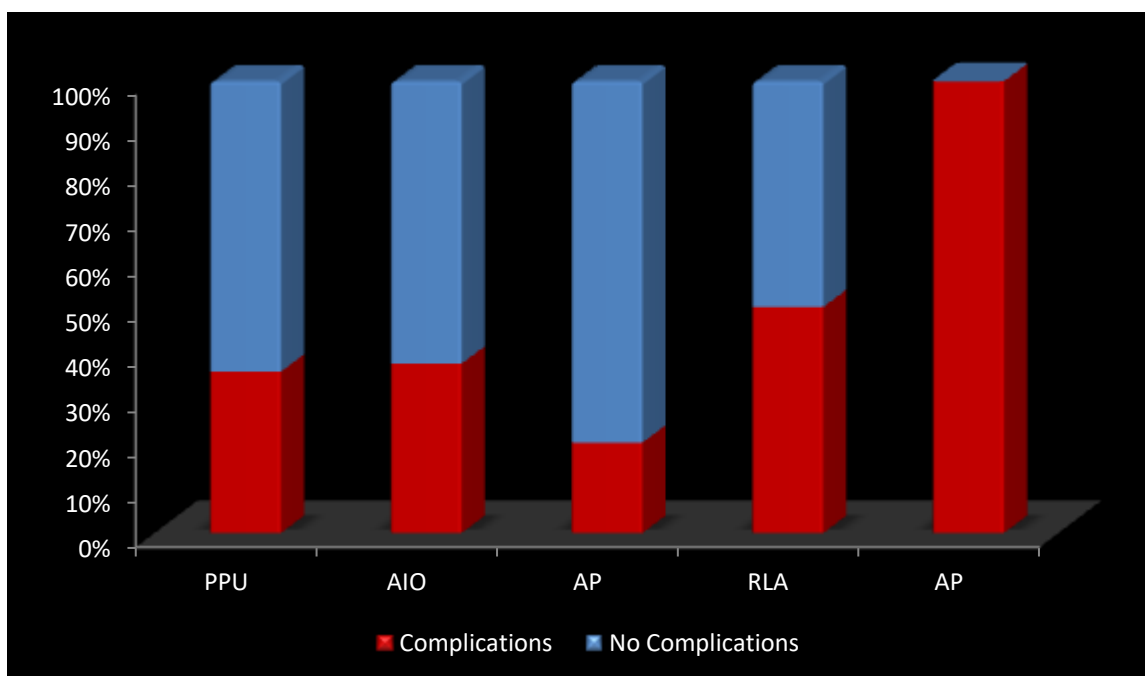


Table 8: Post-operative outcomes and serum albumin level

Serum Albumin (g/dl)	Total no. of patients	Complications	No Complications	Percentage
≤ 3	9	6	3	66.66 %
3.1-3.5	10	3	7	33.33 %
≥ 3.6	11	2	10	18.18 %

Indications For Surgery:

In the study indications for emergency laparotomy are perforated peptic ulcer, acute intestinal obstruction, appendicular perforation, ruptured liver abscess and ceecal perforation. Perforated peptic ulcer are majority of patients followed by acute intestinal obstruction. Only one case of ceecal perforation was present.

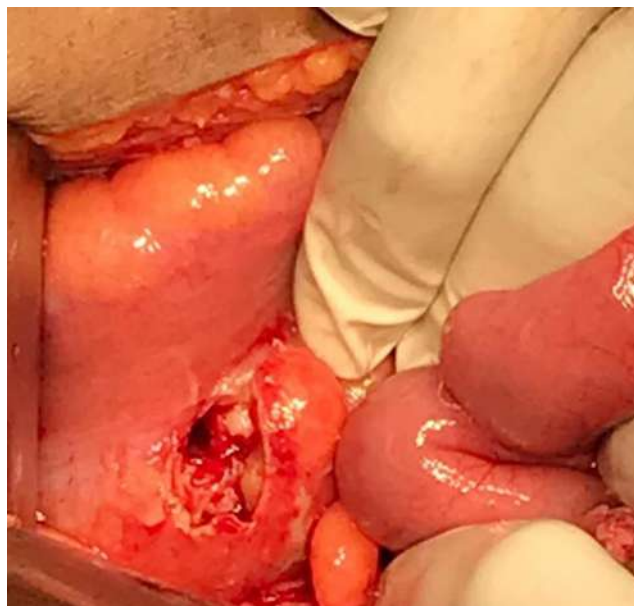
14 cases were operated for perforated peptic ulcer. 9 cases were operated for acute intestinal obstruction. 5 cases were operated for appendicular perforation. 2 cases were operated for ruptured liver abscess. one case of ceecal perforation was operated.

Indications for emergency laparotomy in this study were similar to study by Gejoe Get.al. In which indications for emergency laparotomy included gastrointestinal perforation 57% of cases and intestinal obstruction in 33% of cases. The most common condition that resulted in an emergency laparotomy was duodenal perforation (93 patients), followed by gastric perforation (60 patients).⁴³

GASTRIC PERFORATION



CEACAL PERFORATION



Postoperative Complications:

In the total sample size of 30 cases 11 cases had postoperative complications i.e. 36.66% of complication rate. Out of 14 cases operated for perforated peptic ulcer 5 cases had postop complications. Out of 9 cases operated for acute intestinal obstruction 3 cases had postop complications. Out of 5 cases operated for appendicular perforation 1 case had postop complications. 2 cases were operated for ruptured liver abscess of which one case had postop

complication. Only one case of cecal perforation was operated which had wound dehiscence.

Postoperative complications studied were superficial surgical site infection, wound dehiscence and anastomotic leak. 72.27% cases had superficial surgical site infections, 18.18% cases had wound dehiscence and 9.09% cases had anastomotic leak.

5 cases with superficial surgical site infection underwent secondary suturing under local anesthesia.

2 cases with wound dehiscence underwent initial bagota bag closure later, secondary closure was done under epidural anesthesia on POD 10.

Case with anastomotic leak, which was minimal and asymptomatic, it was managed conservatively with NBM and antibiotics.

Preoperative Serum Albumin And Postoperative Complications:

Total sample size were studied for preoperative serum albumin level and divided into three groups. Patients with serum albumin level ≤ 3 gm/dl as one group, 3.1-3.5 gm/dl as second group, ≥ 3.6 gm/dl as third group.

Total 9 cases were identified with preoperative serum albumin level ≤ 3 gm/dl of which 6 cases had postoperative complications i.e. 66.66% of postoperative complication rate.

Total 10 cases were identified with preoperative serum albumin level 3.1-3.5 gm/dl of which 3 cases had postoperative complications i.e. 33.33% of postoperative complications.

Total 11 cases were identified with preoperative serum albumin level ≥ 3.6 gm/dl of which 2 cases had postoperative complications i.e. 18.18 % of postoperative complications.

This data clearly shows increased postoperative complication rates among cases with preoperative serum albumin level ≤ 3 gm/dl is higher than normal complication rate of 30-40% in an emergency abdominal surgery.

Complication rate in cases with preoperative serum albumin level between 3.1-3.5 gm/dl was higher than cases with levels ≥ 3.6 gm/dl.

Two cases had postoperative wound dehiscence both had preoperative serum albumin levels ≤ 3 gm/dl and one case with anastomotic leak had preoperative serum albumin level of 2.6 gm/dl.

Thus preoperative serum albumin level has predictive value in postoperative outcome in emergency abdominal surgeries.

SUPERFICIAL SSI



BURST ABDOMEN



Discussion

Albumin, serves as main serum-binding protein in the body and take part in various metabolic activities across the body. It accounts for more than half of total protein stores in the body and helps to plasma oncotic pressure to maintain normal at capillary level. Bilirubin, fatty acids, ions, trace elements, vitamins, hormones, and medicines are all transported by albumin. Platelet functions are also influenced by albumin levels in the blood. Homeostasis of various organ systems like circulatory, renal, immune depend on normal albumin level. Undernutrition is one of the major risk factors leading to poor postoperative outcome with increased morbidity and serum albumin is an direct indicator of undernutrition. In response to stress like infection, trauma or surgery there will be increased levels of cytokines like TNF, IL-6 these in turn cause increased vascular permeability, increased catabolism, and decreased anabolism. Increased vascular permeability causes leak of albumin into extra vascular space and decreased production all lead to Hypoalbuminemia. Hypoalbuminemia causes aberrant gastrointestinal

malabsorption, a weakened immune response, and decreased albumin and other plasma protein synthesis in the liver. Although its surgical prognostic potential was underused, the preoperative serum albumin level is connected to the outcome of both emergency and elective surgery.

This is an observational study done over a period of 18 months in our tertiary care centre, total of 30 cases undergoing emergency abdominal surgeries met the inclusion criteria and were studied. The preoperative serum albumin level was noted and postoperative outcome were assessed based on Superficial surgical site infection, wound dehiscence, anastomotic leak and prolonged hospital stay.

Conclusion

1. According to our study, sr. albumin is an effective predictor of postoperative problems.
2. The risk of complications decreased in the serum albumin ranges of 3–3.5 gm/dl and 3–3.5 gm/dl.
3. Patients with serum albumin levels of less than 3.0 g/dl had a significantly greater complication

rate than those with levels of 3 – 3.5 gm/dl and > 3.5 gm/dl.

4. Patients with serum albumin levels greater than 3.5 g/dl had fewer problems, which was statistically significant.
5. As a result, serum albumin is an excellent prognostic predictor due to its capacity to detect PEM, which is not always linked with reduced body weight and may not be clinically recognised, but is associated with a considerable increase in morbidity.
6. Thus preoperative serum albumin level < 3.5 gm/dl indicates increased chances of post-operative complications like surgical site infections, wound dehiscence, anastomotic leak and prolonged hospital stay.
7. More study is needed, involving many surgical specialties, to assess the significance of preoperative serum albumin levels as a predictor of postoperative prognosis.

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