The Role Of Serum Albumin In Perioperative Outcome In Major Gastrointestinal Surgery

Dr. Ghanshyam kumawat[1], Dr. Shubham Bansal[2], Dr. Vinod Sharma[3], Dr. Shalu Gupta[4]

[1]Department of General Surgery, SMS Medical College, Jaipur, India
[2]Department of General Surgery, SMS Medical College, Jaipur, India
[3]Department of General Surgery, SMS Medical College, Jaipur, India
[4]Department of General Surgery, SMS Medical College, Jaipur, India

Abstract
Background*- The goal of nutritional support in the surgical patient is to prevent or reverse the catabolic effects of disease or injury. Nutritional assessment is essential for identifying patients who are at risk of developing complications related to significant malnutrition. Serum albumin is the most important laboratory test for the diagnosis of protein calorie under nutrition.*
Methods- *All patients 20 to 80 years of age undergoing major gastrointestinal surgery under the surgical unit 2, department of surgery in SMS hospital, Jaipur.*
Result- *It was observed that the rate of complication was more when serum albumin level was less than 3.5 gm/dl which is statistically significant. Serum albumin level >3.5gm/dl were associated with statistically significant lower complications using the Chi square test.*
Conclusion- *Our study shows that serum albumin is a good indicator of postoperative complications.*
Key words *– Albumin, Nutritional assessment, major gastrointestinal surgery, complications*

Date of Submission: 25-05-2023   Date of Acceptance: 05-06-2023

I.   Introduction

Malnutrition is a common problem in patients with gastrointestinal disease which adversely affects surgical outcomes. Decreased serum albumin is a good and simple predictor of surgical risk and has a close correlation with the degree of malnutrition.

The adverse effects of malnutrition are common and occurs in about 30% of surgical patients with gastrointestinal diseases and in up to 60% of those in whom hospital stay has been prolonged because of perioperative complications.

The serum albumin level is the most readily available and clinically useful parameter. A serum albumin level greater than 3.5 g% suggests adequate protein stores and it confers a protective effect through several biological mechanisms. It predicts perioperative morbidity and mortality.(1)

Serum albumin is the most important laboratory test for the diagnosis of protein calorie under nutrition. Most patients with severe protein depletion will have low serum albumin levels. Patients with abnormal parameter have a markedly increased risk of poor clinical outcomes. Hypoalbuminemia is associated with higher rate of postoperative complications.

II.   Materials & Methods

Study Design – Hospital based, Prospective Observational Study

Study Location: Patients admitted in surgical unit 2, SMS medical college,Jaipur for any major gastrointestinal surgery between

Study Duration: May 2020 to November 2021.

sample size (n) = 115

Inclusion criteria: All patients 20 to 80 years of age undergoing major gastrointestinal surgery under the surgical unit 2, department of surgery in SMS hospital, Jaipur Patients giving informed consent

---

Exclusion Criteria:

o   Patients not giving consent
o   Severe anemia
o   Chronic renal failure
o   Chronic liver disease
o   Immunocompromised patients

Method of collection of data:

•   Details of cases was recorded including history and clinical examination
•   Written informed consent will be obtained
•   Nature of the disease, operative steps and possible complications will be explained
•   All cases will be operated in a single surgical unit.
•   Serum albumin will be estimated
•   Observation will be done till patient is discharged from hospital for any complication.
•   The result will be analyzed using appropriate statistical methods.

III.   RESULTS

The study was conducted on 115 patients, aged between 20 -80 years, who underwent any major gastrointestinal surgery in surgical unit 2, SMS from June 2020 to November 2021. Among 115 patients, 35 patients developed complications and 80 had uneventful recovery.

Table no 1 Sex Distribution:

sex	number	percentage	complications	No complications
Male	70	61	20(29%)	50(71%)
female	45	39	15(33%)	30(67%)

Of the 115 patients studied, 61% were male and 39% were female. Complications occurred in 29% of male patients and 33% of female patients. 57% complications developed in male patients and 43% complications developed in female patients.
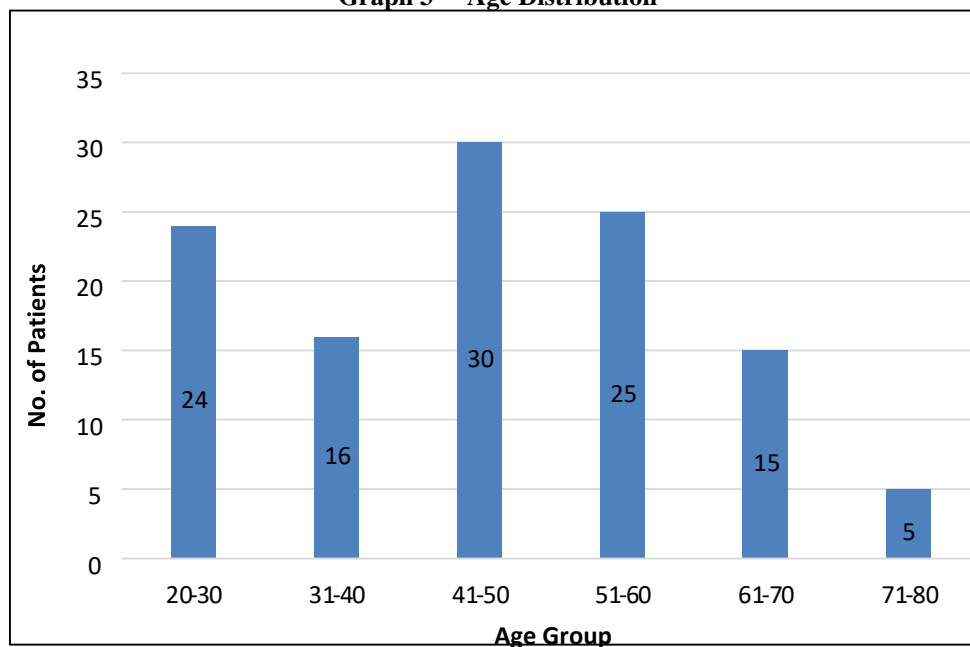
Graph 1

Graph 2

Sex & Complication Rate
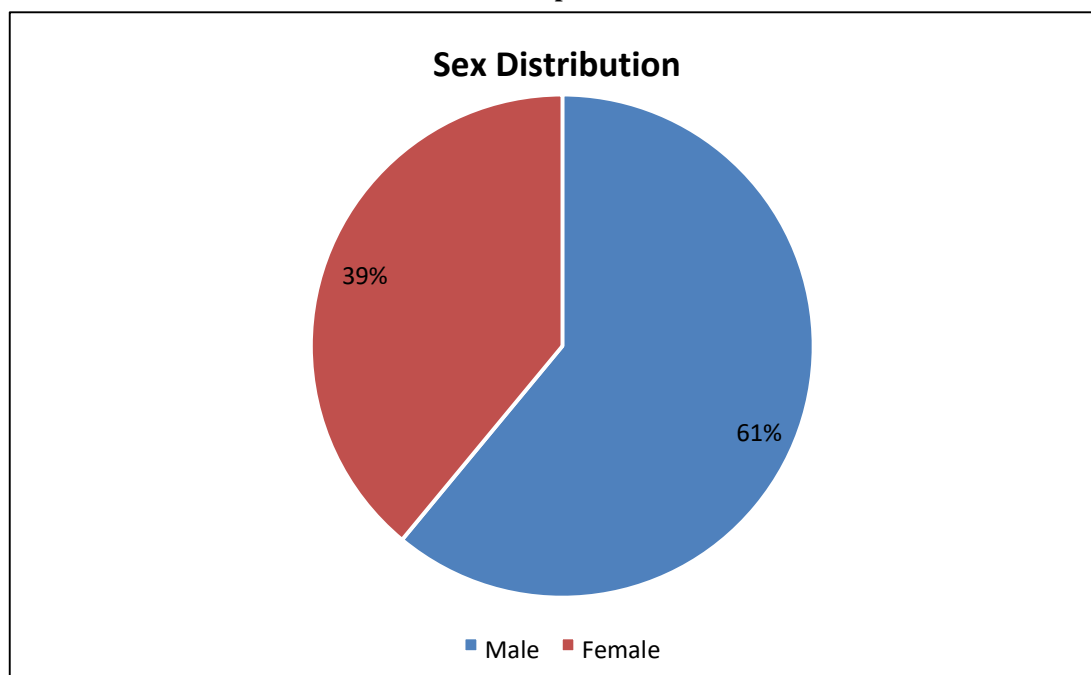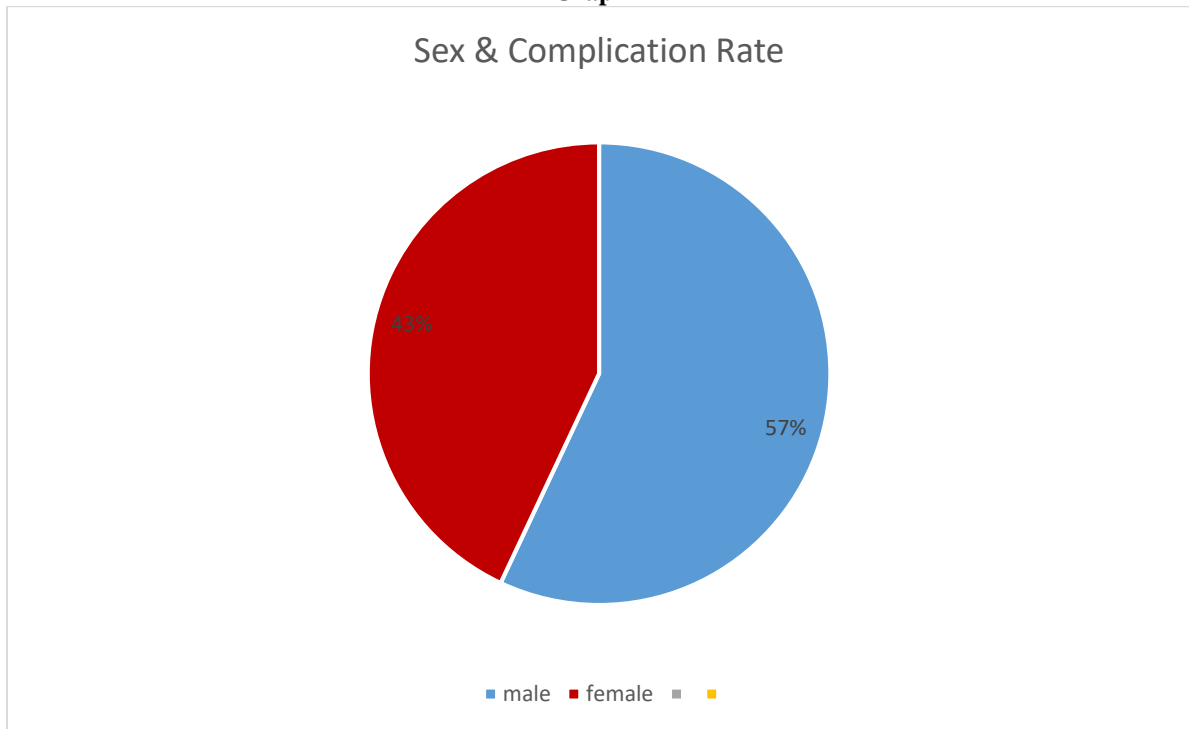
57% complications in the study developed in male patients and 43% complications developed in female patients.

Table 2 Age Distribution

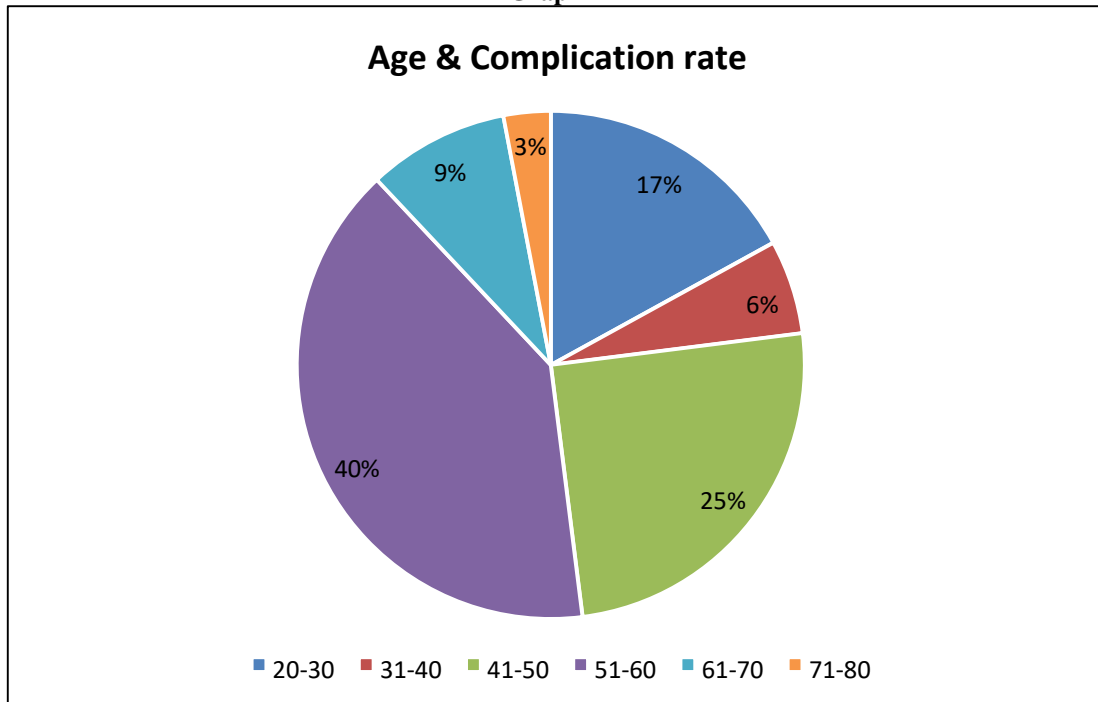| Age(years)	20-30	31-40	41-50	51-60	61-70	71-80
Total no	24	16	30	25	15	05
Complication	06	02	09	14	03	01
No Complication	18	14	21	11	12	04

Of the 115 patients, the age varied from 20-80 yrs. The maximum patients were in the age group of 41 - 50 years (26%) and the maximum complications were noted in the age group of 51-60 years (40%).

Graph 3   Age Distribution
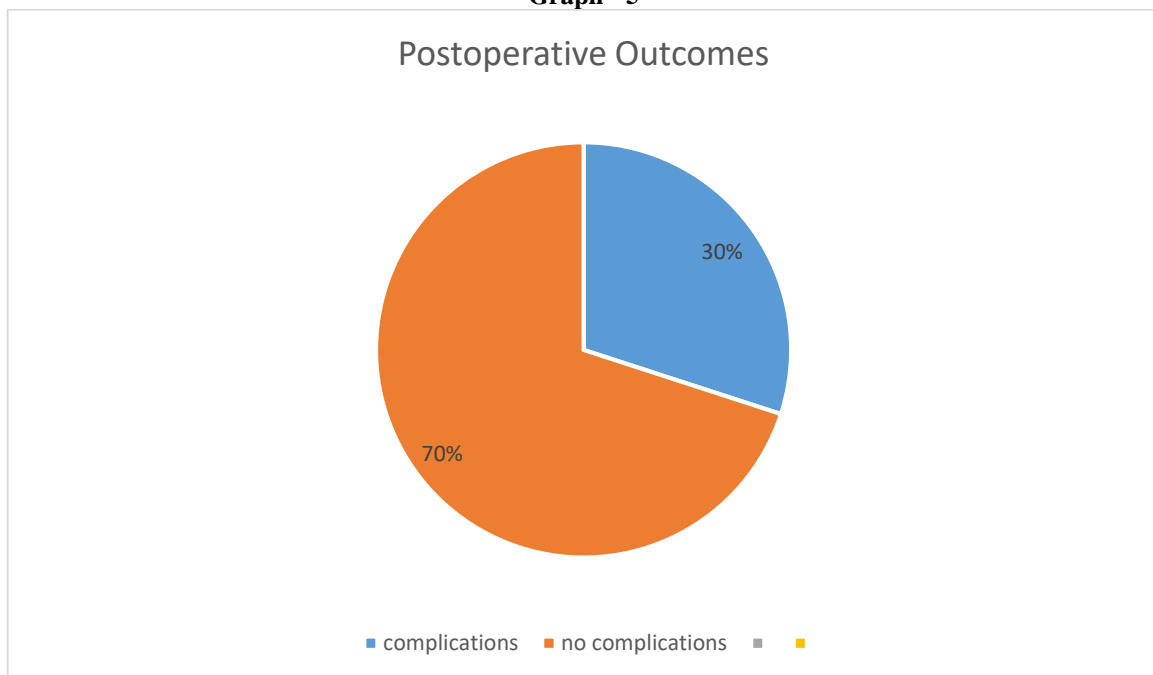
Graph 4

Age & Complication rate

Among all the age group patients between 51-60 years have the highest complication rate - 40%.

Table 3 Post operative outcomes

	No. of cases	Percentage (%)
Post op complications	35	30
No complications	80	70

35 out of the 115 patients (30%) had postoperative complications

Graph - 5

Postoperative Outcomes

30% had postoperative complications in the study.

Table 4 Level of Serum Albumin and postoperative outcome

Serum Albumin (g/dl)	Total no. of Patients	Complications	No complications	P values
<3.5	38	30	8	<0.001
≥3.5	77	5	72	<0.001

It was observed that the rate of complication was more when serum albumin level was less than 3.5 gm/dl which is statistically significant. Serum albumin level >3.5gm/dl were associated with statistically significant lower complications using the Chi square test.

Graph 6   SERUM ALBUMIN-COMPLICATION RATE:
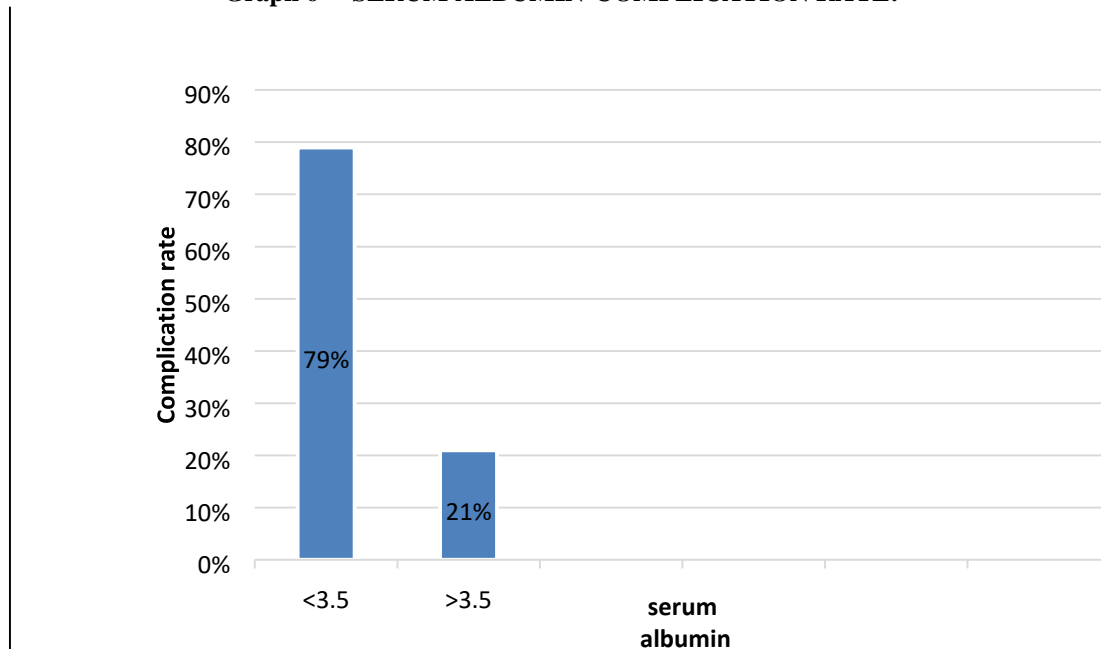
When comparing the serum albumin to the complication rate, it was found that patients with albumin <3.5g/dl had 79% complication. Patients with albumin ≥3.5g/dl had 21% complication rate.

Table 5: Comparison of elective Vs emergency diseases with postoperative complications

	Complications	No Complications	Total
Elective	19(21%)	71(79%)	90
Emergency	16(64%)	9(36%)	25

P value- <0.001

Among the 115 total patients studied 90(78%) were elective & 25(22%) were emergency cases. In elective cases 21% patients developed complications while in emergency cases 64% patients developed complications. It was observed that the rate of complication was more in emergency cases than elective which is statistically significant.
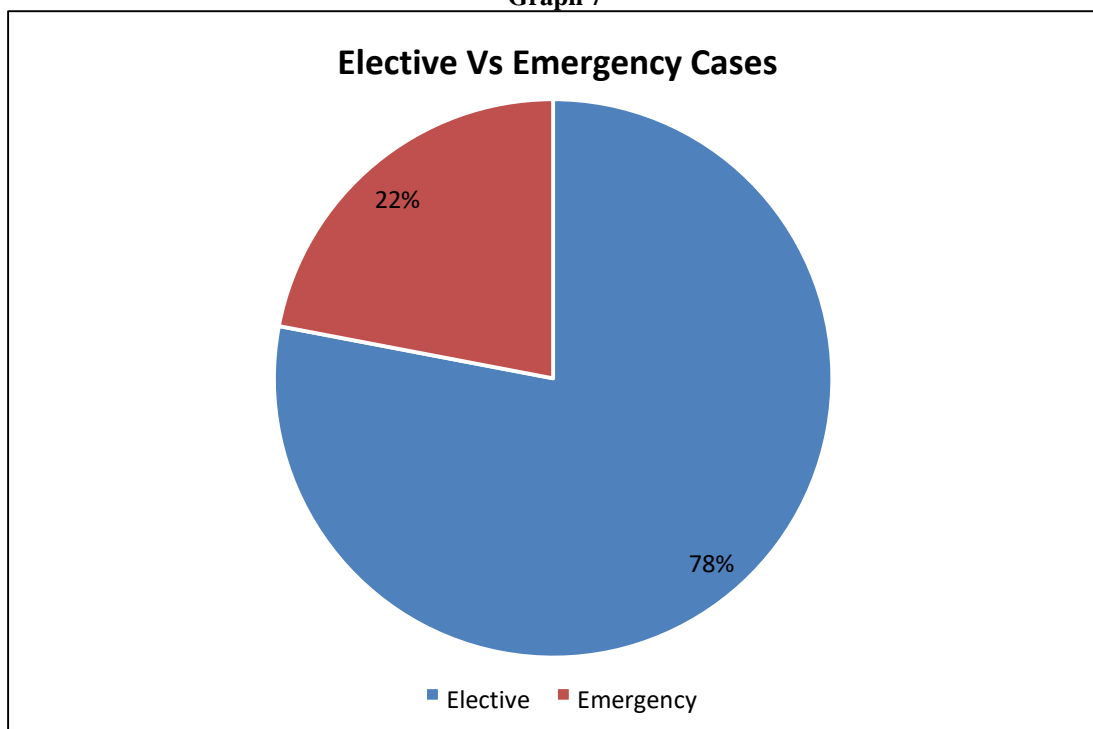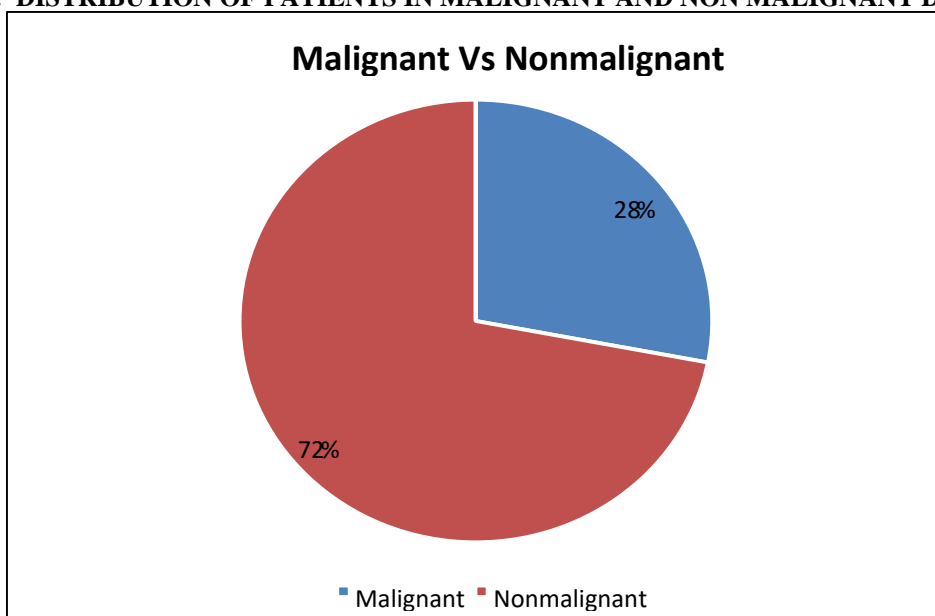
Graph 7

Elective Vs Emergency Cases

22%

78%

■ Elective ■ Emergency

Table 6: Comparison of malignant Vs non-malignant diseases with postoperative complications

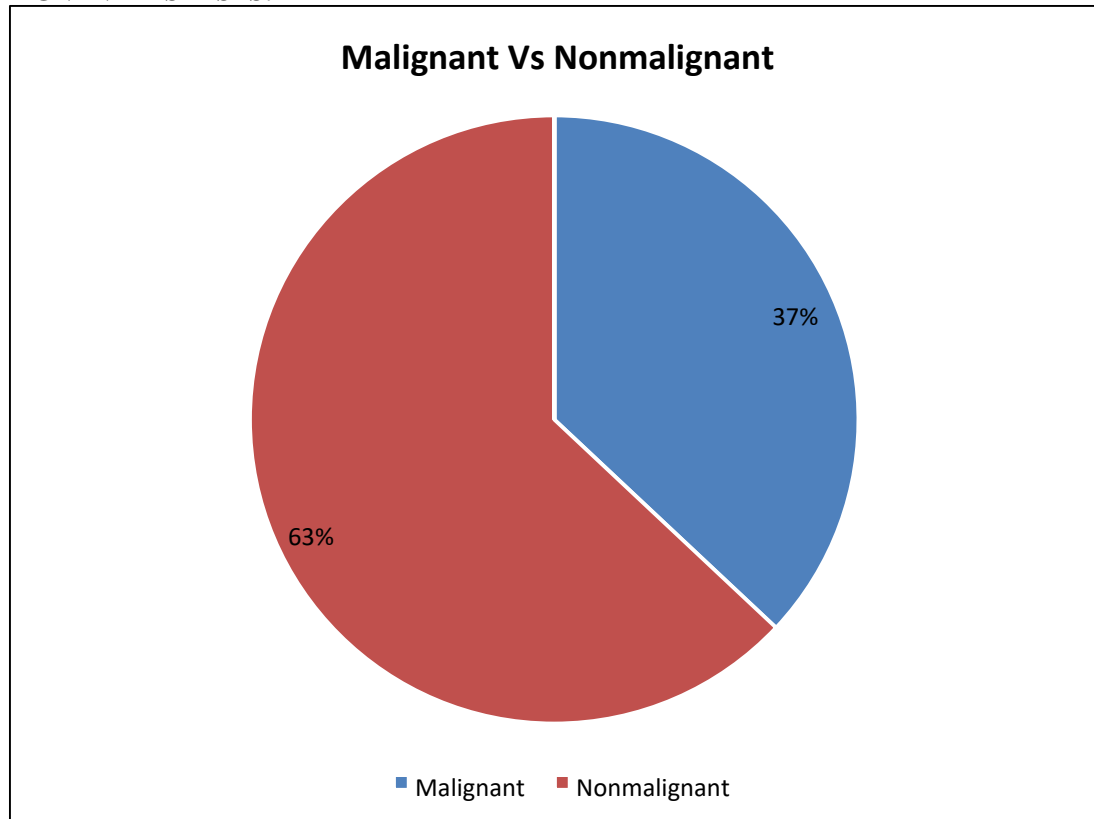|	Complications	No Complications	Total
Malignant	13(41%)	19(59%)	32
Non Malignant	22(27%)	61(73%)	83

P value- 0.212

Among the 115 total patients studied 32 (28%) were having malignant disease and 83 (72%) were not having malignant disease. In malignant cases 41% patients developed complications while in nonmalignant cases 27% patients developed complications. It was observed that the rate of complication was more in malignant cases than non malignant which is statistically not significant.

Graph 8: DISTRIBUTION OF PATIENTS IN MALIGNANT AND NON MALIGNANT DISEASES:

Malignant Vs Nonmalignant

28%

72%

■ Malignant ■ Nonmalignant

Graph 9 : RATE OF COMPLICATIONS IN MALIGNANT AND NON MALIGNANT DISEASES:

Malignant Vs Nonmalignant

37%

63%

■ Malignant ■ Nonmalignant

37% complications developed in malignant group and the rest 63% belonged to nonmalignant group.

IV. Conclusion

Our study shows that serum albumin is a good indicator of postoperative complications.

The patients with serum albumin <3.5g/dl had a higher complication rate which was statistically significant (p<0.001). Patients with serum albumin >3.5g/dl had less complications which was statistically significant (p<0.001).

The complication rate was statistically significant in the emergency cases when considered separately (p<0.001).

The complication rate was more in malignant cases than non malignant cases but statistically not significant(p=0.212).

Thus serum albumin is a good prognostic indicator because of its ability to detect PEM, which is not necessarily accompanied by lower body weight and may not be clinically recognizable, but is associated with significant increased risk of morbidity and mortality.

Bibliography:

[1].   John MacFie; Nutrition and Fluid Therapy. Bailey and Love, Short Practice of Surgery 25th edn, 223.
[2].   N.Engl. J. Med 1991; 325:52; The Washington Manual of Surgery; 5th edition
[3].   N. Engl. J. Med 1991; 325:525 Arch surg 1999; 134:36; The Washington Manual of Surgery; 5th edition
[4].   Robert B Baron Nutrition - Assessment of nutritional status. Current Medical Diagnosis and Treatment 2006; 1263
[5].   Badac V. Jan, Stephen F. Lowry Systemic response to injury and metabolic support; 9th edition, 40 Shwartz Principles of Surgery
[6].   Adrion Barbul, David T Efron Wound Healing; Shwartz principles of Surgery; 9 th edition, 210 7) Sean C. Glasgow, Virginia M. Hermann, Surgical metabolism and nutrition. Current Surgical Diagnosis and Treatment, 12th edition, 140-44
[7].   Hugo Q. Cheng preoperative evaluation and perioperative management. Current Medical Diagnosis and Treatment 2010; 53-54
[8].   Anne Coble Voss, Kathleen E. Mayer. Role of liquid dietary supplements. Nutrition in the prevention and treatment of disease; 465-66
[9].   Allison,D.B., Gallagher,D., Heo.M., et al. BMI and all cause mortality any people age 70 and over: The longitudinal study of aging. Int.J.Obes 21, 424-431.
[10]. Bonnie A. Spear. Nutrition in adolescence. Krause's Food, Nutrition and Diet therapy; 11th edition, 286,330
[11]. Robbins, Cotrans. Tissue Renewal and Repair. Regeneration, Healing and Fibrosis. Robbins and Cotran Pathologic Basis of Diseases; 7th edition; 107
[12]. Dorothy B.Doughty, Bonnie Sparks-Defriese Wound Healing Physiology, Acute and Chronic of Modern Wounds Current Management Concepts; 3rd edition; 57