

## Preoperative Serum Albumin and Body Mass Index as Predictors of Post Operative Morbidity and Mortality in Major Elective and Emergency Surgeries

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### Abstract

**Aim:**To study the preoperative serum albumin and body mass index as predictors of post operative morbidity and mortality in elective and emergency major surgeries.

**Methods:** Details of the cases are recorded including history , clinical examination , investigations done and intraoperative findings. Anthropometry – height and weight recorded pre-operatively. BMI – weight [kg] / height [m<sup>2</sup>] . Serum albumin measured preoperatively. The patients are to be followed up after surgery and watched for complications such as wound gaping , seroma formation , wound infection , flap necrosis , fistula formation and death during the post operative period.

**Results:**For all major operations , patients with low serum albumin level and abnormal BMI had faced post op complications.The increase in morbidity seems to be exponential as the level of albumin level decreases from a level of approximately 3.5 gm/dL. Thus coming to the conclusion that Albumin level is the strongest predictor in both mortality and morbidity for all major operations .

**Conclusion:** Serum albumin concentration is a better predictor of surgical outcomes than many other pre operative patient characteristics. It is a relatively low cost test that should be used more frequently as a prognostic tool to detect malnutrition and risk of adverse surgical outcomes , particularly in populations whom co-morbid conditions are relatively frequent.altered BMI indicating malnourishment and obesity also related with post op morbidity

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### I. Introduction

The prevalence of malnutrition among people undergoing surgery is very high and is about 10-54% Malnutrition is associated with defective wound healing and infection. Wound healing is a catabolic process. For proper wound healing a lot of energy is required. Patients with malnourishment have impaired wound healing and also they have increased predisposition to infections and deficient immune mechanisms. So the supportive supplementation of nutrition in post operative patients will meet the demands of catabolic process and it enhances wound healing. The degree of malnutrition is estimated on the basis of plasma protein assessment, weight loss, physical findings.

The serum Albumin level is clinically useful and the most readily available parameter. A serum albumin level greater than 3.5 gm/dL indicates adequate protein scores. A serum albumin level less than 3.5 gm/dL indicates potential surgical complications. A body mass index of 19 – 25 for an average adult indicates a normal nutritional status. A BMI less than 18 suggests potential surgical complications. This study targets at correlating pre-operative serum albumin and Body Mass Index as predictors of morbidity and mortality in major surgeries. Serum albumin levels measured along with BMI for all patients who are admitted for elective and emergency major surgeries in the Department of General surgery , Government Mohan Kumaramangalam Medical College hospital.

### II. Aims And Objective

To study the preoperative serum albumin and body mass index as predictors of post operative morbidity and mortality in elective and emergency major surgeries.

### III. Materials And Methods

#### STUDY AREA:

Government Mohan Kumaramangalam Medical College And hospital [GMKMCH] .

Study population:

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- Patients admitted in GMKMCH surgical wards who are posted for major elective and emergency surgeries between October 2018 and December 2019.

**INCLUSION CRITERIA:**

1. Patients admitted for any major elective and emergency surgery in the Department of General Surgery, Government Mohan Kumaramangalam Medical Hospital.
2. Patients both male and females older than 12 years of age.

**EXCLUSION CRITERIA:**

- Patients with diabetes mellitus
- Patients with severe anemia < 7gms%
- Patients with chronic liver disease
- Patients with chronic renal failure
- Immunosuppressive patients
- Patients on chemotherapy drugs
- Patients undergoing laproscopic surgeries.

**STUDY PERIOD:**

From October 2018-december 2019

**SAMPLE SIZE:**

100 (elective surgery-50; emergency surgery-50)

.All patients eligible by inclusion and exclusion criteria are to be included in the study.

**STUDY DESIGN:**

A Prospective study is to be conducted on patients admitted in GMKMCH for elective and emergency major surgeries.

Informed consent will be taken from each respondent.

**METHODS** – 1. Details of cases will be recorded including history, clinical examination, investigations done and intraoperative findings.

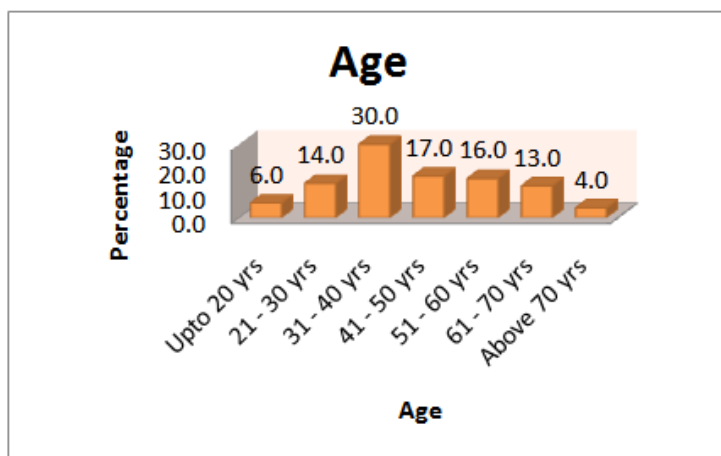
2. Anthropometry – height and weight recorded preoperatively. a. BMI – weight [kg] / height [m<sup>2</sup>]  
Underweight - <18.5 Normal – 18.5 – 24.9 Overweight – 25-29.9 Obesity – BMI of 30 or greater

3. Serum Albumin measured preoperatively

4. The patients are to be followed up after surgery and watched for complications like wound gaping, seroma formation, wound infection, flap necrosis, fistula formation etc, during the post operative period.

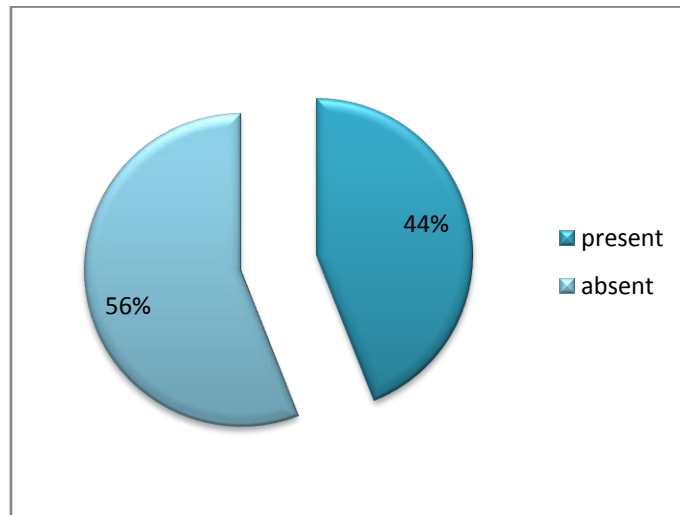
**IV. Results:**

**COMPLICATIONS AND AGE:**



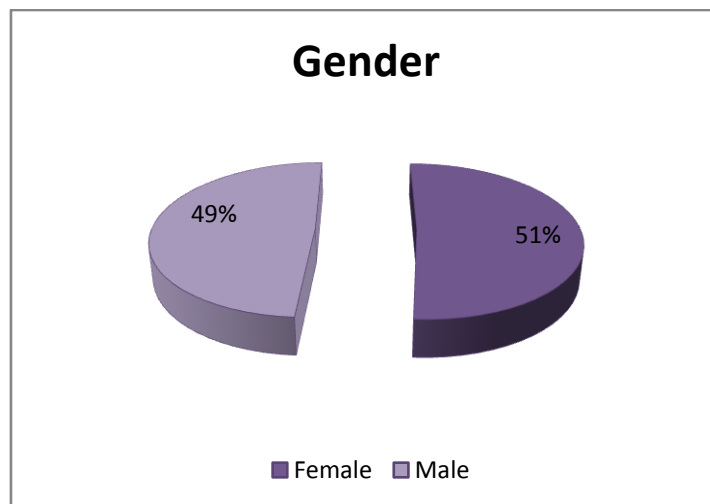
The incidence of complication is highest among the age group 31-40 and the percentage is 30. the second highest is among 41-50 years of age.

OVERALL COMPLICATION:



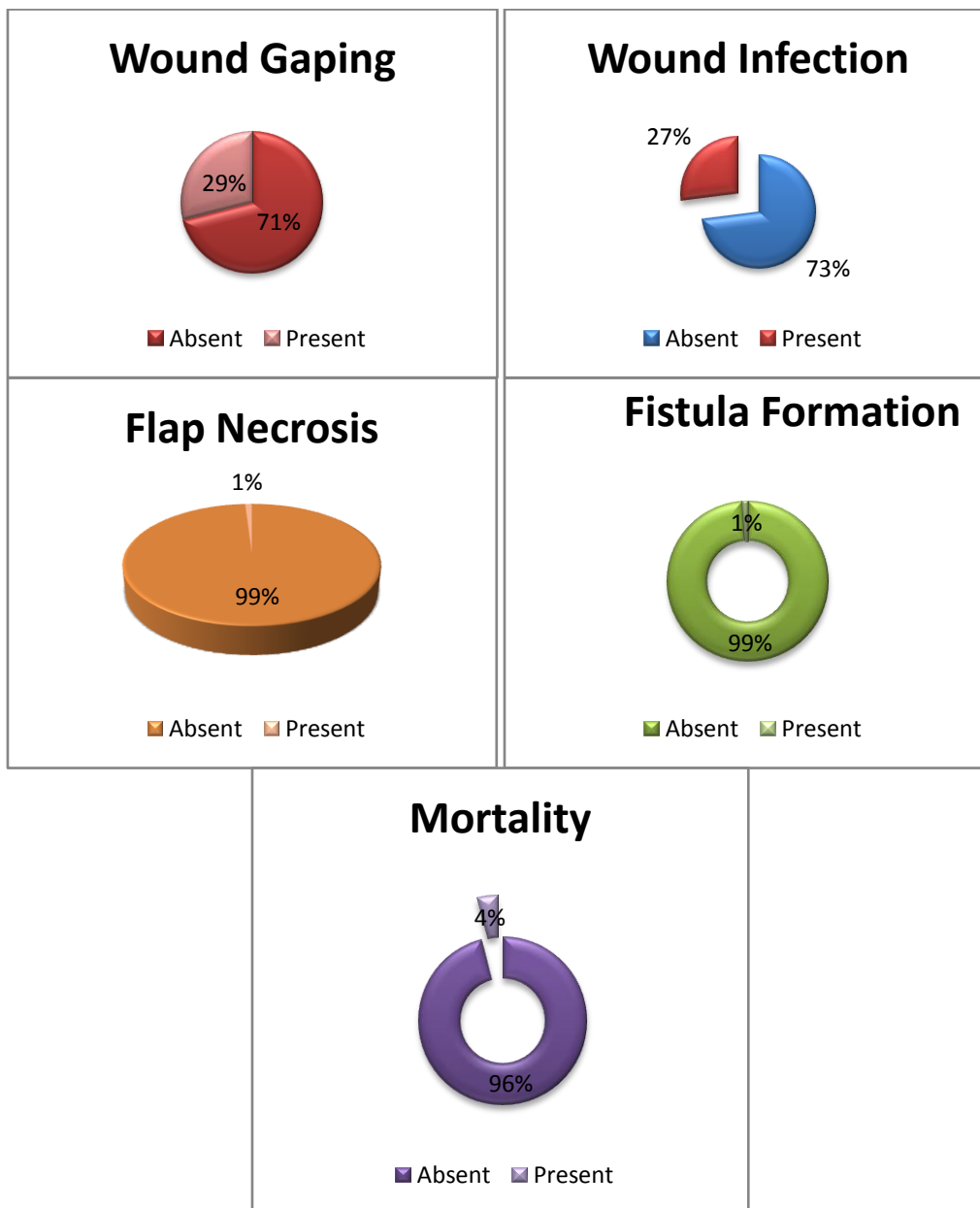
Among the total no of persons operated 44% had complications and 56% were free of complications.

SEX DISTRIBUTION:



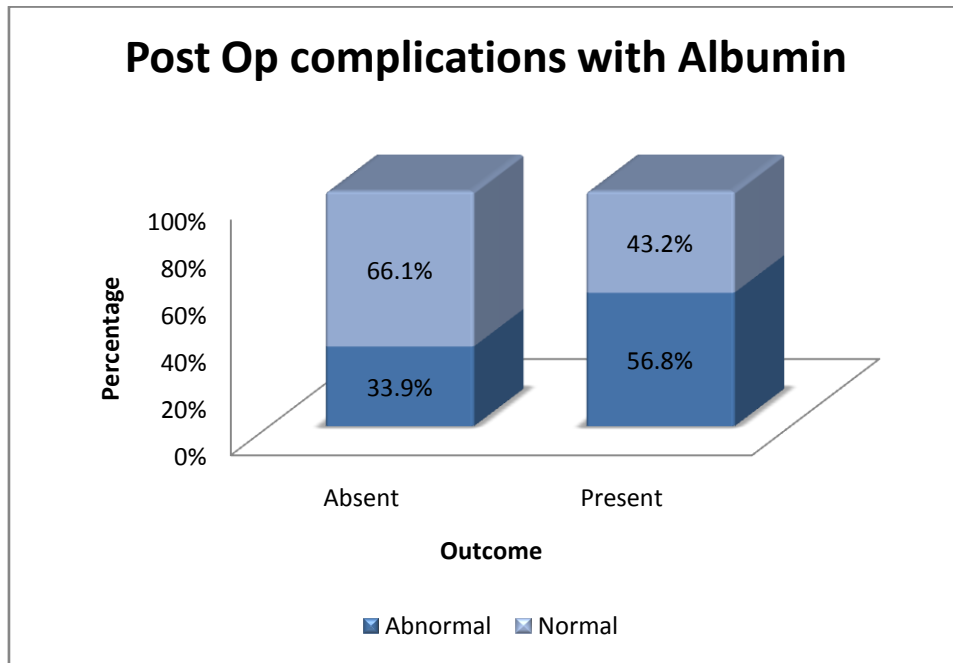
The percentage of complication is highest among females than males. For females it is 51% and for males it is 49%.

TOTAL NO OF PERSONS WITH COMPLICATION:



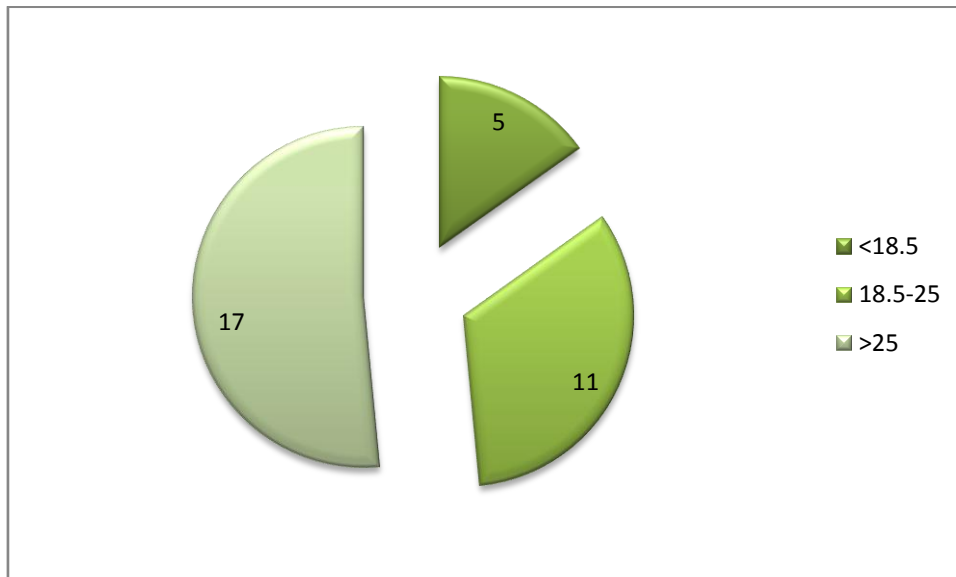
Among the patients operated 29% had wound gaping, 27% had wound infection, 1% had flap necrosis, 1% had fistula formation and 4% had faced mortality.

SERUM ALBUMIN AND COMPLICATIONS:



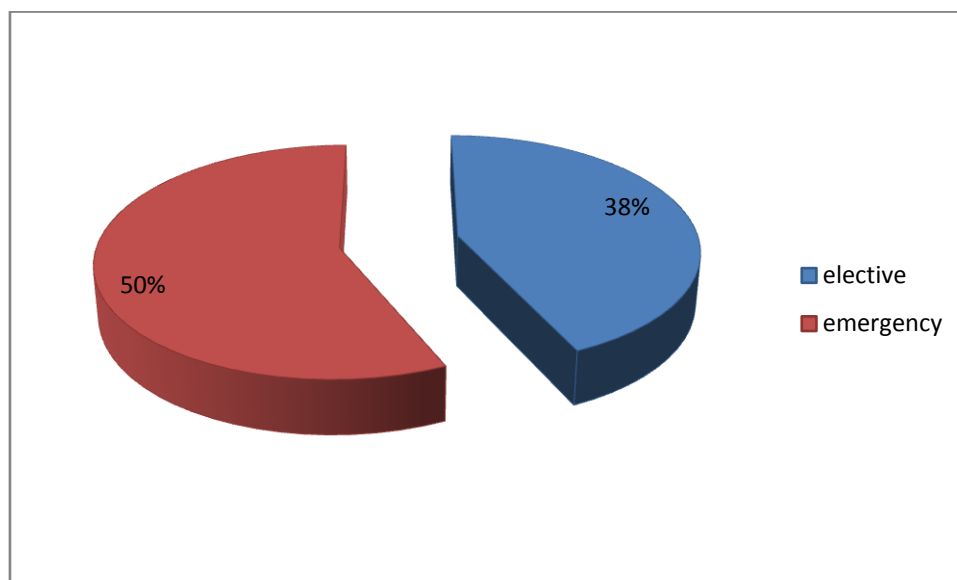
56% of the people with abnormal human albumin faced post op complications. and only 33.9% of the people with normal albumin level faced complications

BMI AND COMPLICATIONS:



The no of persons with complications with normal BMI is 11 and with abnormal BMI is 22.

COMPLICATION DISTRIBUTION IN ELECTIVE AND EMERGENCY SURGERY:



Among the patients operated 25 of the patient with emergency surgery had complications and in elective surgeries only 19 had complications

### V. Discussion

Among the total persons underwent surgeries 44 faced complications..overall complication rate among patients underwent surgery is 44%. The occurrence of individual complications were wound gaping-29%,wound infection-27%,flap necrosis-1%,fistula formation 1%,death-4%.complication occurrence in patients with impaired serum albumin level is 56.8% and in people with serum albumin>3.5 is 43.2% and the p value is (0.022).complication occurrence in patients with impaired BMI is 50% and in patients with normal BMI is 25% and the p value is(0.00018).The distribution of complication in elective surgery is 38%and in emergency surgery it is 50%.From the above discussion the p value for comparing preop albumin with post op complications and BMI with post op complications are 0.022 and 0.00018 which is significantly important.thus concludes low levels of serum albumin had deleterious effects on wound healing. For patients with post op complications the serum albumin should be corrected. On further analyzing the BMI of the persons there was an increase in incidence of post operative complications in patients with BMI less than 18.5 and BMI more than 25.5 thereby implying that malnourishment and obesity play an important role in the post operative outcome on major electiveand emergency surgeries. The other results found were that the incidence of complications is higher for females and the incidence is higher for patients undergoing emergency surgeries.

### VI. Conclusion

Serum albumin concentration is a better predictor of surgical outcomes than many other pre operative patient characteristics. It is a relatively low-cost test that should be used more frequently as a prognostic tool to detect malnutrition and risk of adverse surgical outcomes , particularly in populations in whom comorbid conditions are relatively frequent. Adequate stabilization of BMIpre operatively has been shown to decrease the risk of post operative adverse events and hence from this study it is proved that preop albumin and BMI has been shown to affect the outcome of patients in major surgeries.

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