

Preoperative Serum Albumin And Body Mass Index As Predictors of Post Operative Morbidity And Mortality in Elective Major Surgeries

*Dr. R. Subburathanam¹, Dr. M. Anto²

¹(Department of General Surgery, Thoothukudi Medical College and Hospital, India)

²(Department of General Surgery, Thoothukudi Medical College and Hospital, India)

Corresponding author: *Dr. R. Subburathanam

Abstract:

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

Methods : Details of cases will be recorded including history , clinical examination , investigations done and intraoperative findings. Anthropometry – height and weight recorded pre-operatively. BMI – weight [kg] / height [m²] or 703 x weight [lb] / height² [in]. 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 etc. During the post operative period.

Results: A decrease in serum albumin from concentration greater than 46 g/L to less than 21 g/L was associated with an exponential increase in mortality rates from less than 1% to 29% and in morbidity rates from 10% to 65%. In the regression models , albumin level was the strongest predictor of mortality and morbidity for surgery as a whole and within several sub specialities selected for further analysis. Albumin level was a better predictor of some types of morbidity , particularly sepsis and major infections and other types.

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.

Keywords : serum , albumin , mortality , predictor

I. Introduction

Wound healing requires energy and is a catabolic process. Patients who are severely malnourished demonstrate impaired wound healing and have an increased predisposition to infections. They also suffer deficient immune mechanisms. The role of nutritional support in a surgical patient is to reverse the catabolic effects of disease or injury. The degree of malnutrition is estimated on the basis of weight loss during the past 6 months , physical findings and plasma protein assessment. Although a variety of nutritional indices have been found to be valuable in predicting patient outcome by means of risk stratification and objective comparison among patients , when used alone there is no consensus on the best method for assessing the nutritional status. The serum Albumin level is the most readily available and clinically useful parameter. A serum albumin level greater than 3.5 gm/dL suggest adequate protein scores. A serum albumin level less than 3.5 gm/dL raises concern for potential surgical complications.

A body mass index of 19 – 25 for an average adult suggests a normal nutritional status. A BMI less than 18 suggests potential surgical complications. This study therefore aims at correlating pre-operative serum albumin and Body Mass Index as predictors of morbidity and mortality in elective major surgeries. Serum albumin levels are to be measures along with BMI for all patients who are admitted for elective major abdominal surgeries in the Department of General surgery , Coimbatore Medical College hospital. Children <12 years , patients having icterus , severe anemia [Hb<7] diabetes mellitus , Chronic renal disease , Chronic liver disease were excluded from the study and so also patients on long term steroids or chemotherapy.

Background and purpose of the study:

To validate preoperative serum albumin and Body Mass Index as predictors of post operative morbidity and mortality in elective major surgeries.

II. Materials And Methods

Study Area :

Thoothukudi Medical College Hospital [TKMCH] , Thoothukudi

Study population : Patients admitted in CMCH surgical wards who are posted for major elective abdominal surgeries.

Inclusion criteria:

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

Exclusion criteria:

1. Pregnant women
2. Children < 12 years
3. Patients who have Icterus , Severe Anemia [Hb<7] , Diabetes Mellitus , Chronic renal disease and Chronic liver disease.
4. Patients on Long term steroids or Chemotherapy.

Study Period:

12 Months. From July 2016-June 2017

Sample Size: 100. 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 CMCH for elective major abdominal 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 [m²] [or]
 $703 \times \text{weight [lb]} / \text{height}^2 \text{ [in]}$
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.

III. Discussion

For all major elective abdominal operations , the mortality rate increases from less than 1% for albumin levels for albumin levels greater than 3.5 gm/dL or higher to 28% for albumin levels below 2.5 gm/dL. The increase in mortality seems to be exponential as the level of albumin level decreases from a level of approximately 3.0 gm/dL. Albumin level appears in all of the models and is the strongest predictor in both mortality and morbidity models for all major operations and in several sub speciality models. The odds ratios for albumin level in the all major operation model indicate that a decrease of 1 gm/dL albumin value was associated with more than 2- fold increase in the odds of post operative complications such as sepsis and delayed wound healing. On further analyzing the BMI of the patients there was an increase in incidence of post operative complications in patients with BMI less than 18 and BMI more than 30 thereby implying that malnourishment and obesity play a major roles in the post operative outcome on major elective abdominal surgeries.

IV. 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 BMI pre operatively has been shown to decrease the risk of post operative adverse events and hence from this study it is proved that BMI has been shown to affect the outcome of patients in elective major abdominal surgeries.

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