

Serum Albumin Level Would Predict Surgical Site Infections

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Abstract

Background: Surgical site infections are recognised as a common surgical complication, occurring in about 3% of all surgical procedures and in upto 20% of patients undergoing emergency intra-abdominal procedures

Methods: Hospital based prospective study conducted on 100 patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria were included in the study

Results: The no significant association was seen between serum albumin level and surgical site infections.

Conclusion: In this study, we observed that there was a positive association between Hypoalbuminemia and SSI. Hence routine measurement of serum albumin at the time of admission will help in proper optimization of surgical patients so that potential SSI could be reduced.

Keywords: SSI, Albumin, Admission

Introduction

Low total serum cholesterol may contribute to the development of infection. Circulating cholesterol-rich lipoproteins and triglyceride-rich lipoproteins have the capacity to bind and detoxify bacterial LPS. Cholesterol is the precursor of five major classes of steroid hormones. Cholesterol affects gluconeogenesis and immune function; its transport form, the lipoproteins, also serves as vehicles for fat soluble vitamins, antioxidants, drugs and toxins. Cholesterol need for membrane biogenesis, maintenance of membrane fluidity, cell signaling and a beneficial influence on the immune system. Preoperative hypoalbuminemia is well known to be significantly associated with the development of and is an independent risk factor for the development of postoperative SSI. The serum albumin is the most readily and clinically useful parameter. It predicts perioperative morbidity and mortality.¹

The mechanism of increase in infectious etiologies in hypo-albuminemia is multifactorial and likely include impairment of tissue healing decreased collagen

synthesis and granuloma formation. The immune response in hypoalbuminemia is also compromised through impairment of macrophage activity and induction of macrophage apoptosis. These factors together could explain the higher risk of surgical site infections in hypoalbuminemia patients.²

Material and methods

Study design: Hospital based prospective study.

Sample size: 100 patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria were included in the study.

Sampling Method: Systemic random sampling

Inclusion Criteria: Patient admitted in various surgical wards in our institute and willing to participate in the study.

Exclusion Criteria: Patients admitted to wards for less than 1 day were excluded.

An operative definition of surgical site infection was used for an objective case selection and to avoid any bias. We followed the definition as given by CDC.

Data Analysis: Data was recorded as per Performa. The data analysis was computer based; SPSS-22 will be used for analysis. For categoric variables chi-square test was used. For continuous variables independent samples’s t-test was used. p-value <0.05 was considered as significant.

Results

Table 1: General characteristics

Mean age	50.23±11.45 Yrs
Male : Female	60 : 40
Mean hospital stay	5.6 ±3.21 Days

Table 2: Relationship between serum albumin and SSIs

Serum albumin level	No. of SSI	Percentage
<3.5 Gm/dl	5/36	83.33
>3.5 Gm/dl	1/64	16.67
Total	6/100	100.00
P-value =0.23		

Discussion

This relationship is shown Serum total cholesterol levels did not correlate with the development of organ space SSI or pneumonia, which may partially explain the observed lower rates of these two types of infection. While the consequences of elevated cholesterol levels are well understood with respect to the increased risks of coronary disease and thromboembolic stroke, the nature and implications of associations between low serum cholesterol and non-cardiovascular causes of death represent a complex problem and continue to be an active area of research. Hypocholesterolemia has also been associated with the development of nosocomial infections, especially during the postoperative period.³

Preoperative hypoalbuminemia is well known to be significantly associated with the development of and is an independent risk factor for the development of postoperative SSI. Multivariate analysis of the relationship between serum albumin and the development of superficial and deep incisional SSIs showed that preoperative serum albumin <3.0 mg/dl increased the risk of SSI by 4.2-fold⁴. Numerous studies have showed a high risk of developing pneumonia after esophageal surgery. Esophageal surgery was also shown to be a significant risk factor for the development of pneumonia in this study.^{5,6}

Conclusion

In this study, we observed that there was a positive association between Hypoalbuminemia and SSI. Hence routine measurement of serum albumin at the time of admission will help in proper optimization of surgical patients so that potential SSI could be reduced.

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