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Association of Postoperative Wound Infection with Malnutrition and Low Socio-Economic Status

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Abstract
Background: *Malnutrition may also influence wound healing and the incidence of postoperative surgical-wound infections (SWI). The present study was conducted to assess the association of post operative wound infection with malnutrition and low socio economic infection.*
Materials & Methods: *The present study was conducted on 124 patients treated with different complaints of both genders. Body weight and height were measured postoperatively and BMI was calculated as weight/height^2. Risk for malnutrition was considered when one of the following indicators appeared; (1) weight loss >10% the last 6 months, (2) decreased food intake, or (3) BMI < 20 (alternatively BMI < 22 for patients more than 70 years old).*
Results: *out of 124 patients, males were 68 and females were 56. The difference was non- significant (P- 0.1). BMI < 20 was observed in 56 males and 38 females, weight loss >10% was seen in 45 males and 42 females and serum albumin <35 g/L was seen in 52 males and 40 females. The difference was non-significant (P- 0.5). Socio economic status was low in 34 males and 38 females, middle in 16 males and 10 females and high in 18 males and 8 females. The difference was significant (P- 0.01).*
Conclusion: *Author concluded that wound infection increases with poor nutrition status. Socio economic status plays an important role in development of complications in wound healing.*
Keywords: *Malnutrition, Socio- economic, Wound.*

Introduction

An increased incidence of nosocomial infections is related to preoperative malnutrition. Patients with nosocomial infections have higher mortality, spend more days in intensive care units and are more often readmitted to hospital. Malnutrition may also influence wound healing and the incidence of postoperative surgical- wound infections (SWI). It is therefore important to identify malnourished patients at admission to be able to prevent surgical-wound infections.[1]

There are several methods for screening malnutrition and assessing nutritional status. Screening is a rapid process to discriminate the patients already malnourished or at risk for malnutrition from the well-nourished patients. The screening methods usually incorporate anthropometric measurements such as height, weight, and skin fold, and clinical data such as weight change, primary diagnosis, and presence of comorbidities. However, some authors prefer to use biochemical data, such as albumin levels to perform the nutritional screening. Anthropometry

is defined as the scientific study of the measurements of the human body.[2]

The negative impact caused by malnutrition on a patient's outcome was long ago demonstrated. 20% weight loss of usual body weight was correlated to a significant increase in the mortality rate of patients undergoing surgery for duodenal ulcer. On the other hand, infection after surgery is a central cause for increased morbidity and mortality, too. Alterations in both innate and adaptive immune function contribute significantly to increased susceptibility to infections. Finally, patients undergoing major gastrointestinal or cancer surgery are at increased risk of developing complications, such as infectious complications.[3] The present study was conducted to assess the association of post operative wound infection with malnutrition and low socio economic infection.

Materials & Methods

The present study was conducted in the department of general surgery. It comprised of 124 patients treated with different complaints of both genders. All were informed regarding the study and written consent was obtained.

Body weight and height were measured postoperatively and BMI was calculated as weight/height^2. The normal BMI range is defined as 20-25, moderately malnourished as 18.5-20 and severely malnourished as <18.5-19. Alternatively BMI below 22 implies a risk for malnutrition in patients >70 years. Risk for malnutrition was considered when one of the following indicators appeared; (1) weight loss >10% the last 6 months, (2) decreased food intake, or (3) BMI < 20 (alternatively BMI < 22 for patients more than 70 years old). Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 124		
Males	Females	P value
68	56	0.1

Table I shows that out of 124 patients, males were 68 and females were 56. The difference was non-significant (P- 0.1).

Table II Risk factors of wound infections in patients

Parameters	Males	Females	P value
BMI <20	56	38	0.5
Weight loss >10%	45	42	
Serum albumin <35 g/L	52	40	
Socio- economic status Low	34	38	0.01
Middle	16	10	
High	18	8	

Table II shows that BMI < 20 was observed in 56 males and 38 females, weight loss >10% was seen in 45 males and 42 females and serum albumin <35 g/L was seen in 52 males and 40 females. The difference was non- significant (P- 0.5). Socio economic status was low in 34 males and 38 females, middle in 16 males and 10 females and high in 18 males and 8 females. The difference was significant (P- 0.01).

Discussion

Biochemical indicators such as the serum concentration of albumin (S-Albumin) with a half-life of 20 days and insulin- like growth factor 1 (S-IGF-1) with a half-life of 10- 20 h are often used as markers for malnutrition. S-Albumin has shown to be predictive of surgical outcome. However, S-Albumin is associated with the acute-phase response and may be influenced by fluid shift, acute infection or inflammation, and not only the nutritional status.[4]

Patients submitted to digestive system surgery often present poor nutritional status related to the presence of malignancy or chronic disease, older age, lower caloric intake, malabsorption, gastrointestinal obstruction, and higher resting energy expenditure. Surgical trauma increases the resting energy expenditure and the metabolic demand. Malnutrition risk also increases in the presence of inflammation and infection. The consequences of poor nutritional status in

hospitalized patients, generally, include decreased muscle function, respiratory function, immune function and to a high rate of morbidity, such as infectious complications, postoperative complications, and slower wound healing, reoperation, increased length of stay and hospital costs, and increased mortality rates.[5]

We found that out of 124 patients, males were 68 and females were 56. BMI < 20 was observed in 56 males and 38 females, weight loss >10% was seen in 45 males and 42 females and serum albumin <35 g/L was seen in 52 males and 40 females. The difference was non- significant (P-0.5). Socio economic status was low in 34 males and 38 females, middle in 16 males and 10 females and high in 18 males and 8 females. This is similar to Shantanu et al.[6]

Daniela[7] in their study evaluated a total of 125 patients. Malnutrition was diagnosed by mid-arm muscle circumference, nutritional risk index and subjective global assessment in 46%, 88% and 66%, respectively. Severe malnutrition was found in 17.6% if considered subjective global assessment and in 42% by the nutritional risk index. Oncologic patients had a worst nutritional status according to this index. There was a negative correlation between occurrence the noninfectious postoperative complications with the nutritional risk index. Similarly, lower serum albumin levels were associated with higher non infectious complications. The length of hospital stay was, in average, 14. 24 days less in patients without complications as compared with non infectious postoperative complications.

Satish et al[8] assessed 94 patients preoperatively using the Patient-Generated Subjective Global Assessment (PG-SGA), nutritional screening indicators (NSI), nutrition risk index (NRI), and the biochemical indicators serum albumin (S-Albumin) and serum insulin-like growth factor 1 (S-IGF-1). Thirty days postoperatively, a structured infection surveillance questionnaire, weight and blood sampling were conducted. The prevalence of malnutrition preoperatively ranged from 3.2% (PG-SGA) to 17.0e 17.1% (S-IGF-1 and NSI). Thirty days postoperatively, the body weight, the body mass indeed and S-Albumin had decreased, while the S-IGF-1 had increased significantly. The only significant correlation between different methods preoperatively was found between S-Albumin and S-IGF-1. The agreement between NRI and S-Albumin was fair. Six patients (6.4%) developed surgical-wound infections. Preoperative S-Albumin was significantly lower for patients who developed surgical-wound infection compared to those who did not.

Conclusion

Author concluded that wound infection increases with poor nutrition status. Socio economic status plays an important role in development of complications in wound healing.

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