RELATIONSHIP BETWEEN THE PREOPERATIVE ALBUMIN LEVELS AND POSTOPERATIVE COMPLICATIONS IN CARCINOMA STOMACH PATIENTS

Abstract

BackgroundMalnutrition in gastrointestinal cancer patients adversely affects the surgical outcomes. low serum albumin and postoperative complications were associated with one another

ObjectivesTo find out the relationship between preoperative albumin levels and postoperative complications among carcinoma stomach patients.

Material and methods The present study was a retrospective descriptive study carried out in the department of general surgery, Saveetha medical college and hospital between February 2021 to July 2021. Fifty patients diagnosed with carcinoma stomach and electively posted for surgery during the study period were included into the study. The data was collected using structured proforma. Preoperative albumin and haemoglobin levels were estimated using blood samples. All the data collected were analysed using SPSS version 23.

ResultsThe preoperative albumin levels among those who had reported complication was 3.04±0.19 g/dl while those who had no complication in the postoperative period had preoperative albumin level of 3.82±0.31g/dl. The preoperative mean haemoglobin level among those who developed complications in the post operative period was 9.68±0.95 mg/dl and the mean haemoglobin level among those with no complication was 11.46±1.89 mg/dl. Albumin and haemoglobin values were found to be negatively correlated with duration of stay in hospital.

ConclusionMalnutrition in the preoperative period would increase the probability of occurrence of postoperative complications and increased duration of stay in hospital. Attending to malnutrition of the admitted patients in the preoperative period would help in decreasing the postoperative complications and duration of stay.

Keywords Albumin, postoperative complications, carcinoma stomach, relationship, surgical site infection, sepsis, anastomotic leak.

Introduction

Serum albumin is a plasma protein. It is synthesized in the liver. One of the functions of albumin is in regulating the osmotic pressure. Hypoalbuminemia defines as a serum albumin level of less than 3.5g/dl. Serum albumin could act as a biomarker of malnutrition[(1)].Malnutrition among the hospitalised patients have to be addressed as a malnourishment in itself can lead to decreased functionality of the muscular system, immunesystem, respiratory system, would healing and quality of life[(2)]. Malnutrition in many studies has been related to postoperative mortality and morbidity[(3)].

Malnutrition in gastrointestinal cancer patients adversely affects the surgical outcomes[(4)]. Lower serum albumin levels in the preoperative period was linked to short term surgical outcomes in elective gastrointestinal operations[(5)]. A systematic review reported that low serum albumin and postoperative complications were associated with one another. But consensus is yet to be arrived on serum albumin as prognostic factor[(6)]. The objective of the present study was to find out the relationship between preoperative albumin levels and postoperative complications among carcinoma stomach patients.

Methodology

The present study was a retrospective descriptive study carried out in the department of general surgery, Saveetha medical college and hospital between February 2021 to July 2021. Fifty patients diagnosed with carcinoma stomach and electively posted for surgery during the study period were included into the study. The consent for the participation in the study was obtained from all the study participants.Ethical clearance was obtained for the study.

Data was collected from all the participants during both the preoperative and postoperative periods. In the preoperative period, the data collected include sociodemographic characteristics. Preoperative serum albumin levels and haemoglobin were estimated with the help of 5ml venous blood drawn from the patient. All the data collected were entered into structured proforma. In the postoperative period, the data collected included the complication that occurred during that time after surgery and the duration of stay in the hospital.

All the data thus collected were entered into Microsoft excel 2017 and imported into SPSS version 23 for further analysis. The qualitative variables were expressed using percentages and quantitative variables were expressed using mean and standard

deviation. In order to compare the mean values of one variable between two categorical variables, independent sample t test was applied. For finding out the correlation between two quantitative variables, Pearson correlation was used.

Results

Forty percentage of the study participants belonged to the age group of 40 to 49 years, 33.3% belonged to age group between 50 and 59 years. 73.3% were males. The mean albumin level was 3.46 ± 0.47 g/dl. The mean haemoglobin level was 10.63 ± 1.75 mg/dl and the mean duration of stay among the participants was 7.73 ± 2.05 days (Table 1).47% of the participants had reported at least one complication in the postoperative period (Fig 1). 46.7% had reported postoperative fever. 33.3% had surgical site infections, 6.7% had anastomotic leak and sepsis, respectively (Table 2).

When the albumin, haemoglobin and duration of hospital stay were compared between those who had complications and who did not. It was found out the mean albumin levels were lesser among those who had reported complications than those who did not. The preoperative albumin levels among those who had reported complication was 3.04±0.19 g/dl while those who had no complication in the postoperative period had preoperative albumin level of 3.82±0.31g/dl. The preoperative mean haemoglobin level among those who developed complications in the post operative period was 9.68±0.95 mg/dl and the mean haemoglobin level among those with no complication was 11.46±1.89 mg/dl. The haemoglobin level among those with complication was lesser than those who had experienced no complication in the postoperative period. Similarly, the duration of hospital stay was found to be more among those with complications than those without any complications (Table 3).

The albumin levels were found to be positively correlated with haemoglobin levels. It exhibited a strong positive correlation with r value of 0.75. Albumin and haemoglobin values were found to be negatively correlated with duration of stay in hospital. A decreased albumin and haemoglobin levels mean increased duration of stay in hospital. Both albumin and haemoglobin were negatively correlated with duration of stay in hospital and the correlation was statistically significant (Table 4).

Discussion

The present study was a retrospective descriptive study conducted in department of surgery, Saveetha medical college. The main objective of the study was to find out the relationship between preoperative albumin levels and postoperative complications among the patients undergoing elective surgery for carcinoma stomach. Fifty patients undergoing elective surgery for carcinoma stomach during the study period were included into the study.

47 % of the participants had developed at least one complication in the postoperative period. The pattern of complications that had occurred in the present study was similar to the pattern reported by Katiyar V et al[7] in the year 2021. Bozetti F et al in the year 2007 conducted a study which reported 39% had developed postoperative complication. 32% developed major and 7% had developed minor complications[8].

The present study found out that the preoperative mean serum albumin levels were lower among those with postoperative complications than those who had no complications in the postoperative period. Gassa A et al reported that among those with serum albumin level of less than 3.5g/dL, 53% developed postoperative infections while among those with serum albumin level of more than 3.5g/dL, the proportion was 24%. They also reported a significant increase in 30 day mortality among those with hypoalbuminemia[9]. Hickman DM et al conducted a study where he studied two indicators of malnutrition, namely low serum albumin levels and low body weight. The study reported that both the characteristics increased the probability of one developing postoperative complications[10]. One another finding of the present study was the decreased preoperative mean haemoglobin levels among those who had developed complication than those who did not. Anaemia can act as an indicator of malnutrition among the elderly patients[11]. In the present study both albumin and haemoglobin were positively correlated. Both decreased albumin and haemoglobin could act as indicator of malnutrition among patients undergoing elective surgery and hence could increase the probability of postoperative complications in them.

Among those with postoperative complications the duration of hospital stay was more than among those who did not have any complications. The difference was found to be statistically significant with P value of less than 0.05. Both albumin and haemoglobin were negatively correlated with duration of stay in hospital. Lohsiriwat V et al reported a similar finding to our study that hypoalbuminemic patients had longer duration of hospital stay than non-hypoalbuminemic patients[4].

The limitation of the present study one is sample size, the sample collected in the present study was all the patients who had been posted for elective surgery during the study period. A multicentric study would have helped in collecting more sample size. Another limitation lies in the generalisability of the study.

Conclusion

Malnutrition in the preoperative period would increase the probability of occurrence of postoperative complications and increased duration of stay in hospital. A multicentric study with similar objective would diversify the study participants producing a more generalisable results. Attending to malnutrition of the admitted patients in the preoperative period would help in decreasing the postoperative complications and duration of stay.

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Results

Table 1: Baseline the characteristics among the study participants.

Variables		*Frequency*	*Percentage*
Age	40-49	12	40
	50-59	10	33.3
	≥ 60	8	26.7
Sex	Male	22	73.3
	Female	8	26.7
Albumin		3.46 ± 0.47 g/dl	
Haemoglobin		10.63 ± 1.75 mg/dl	
Duration of hospital stay		7.73 ± 2.05 days	

Fig 1: Pie chart showing distribution of study participants with complications.

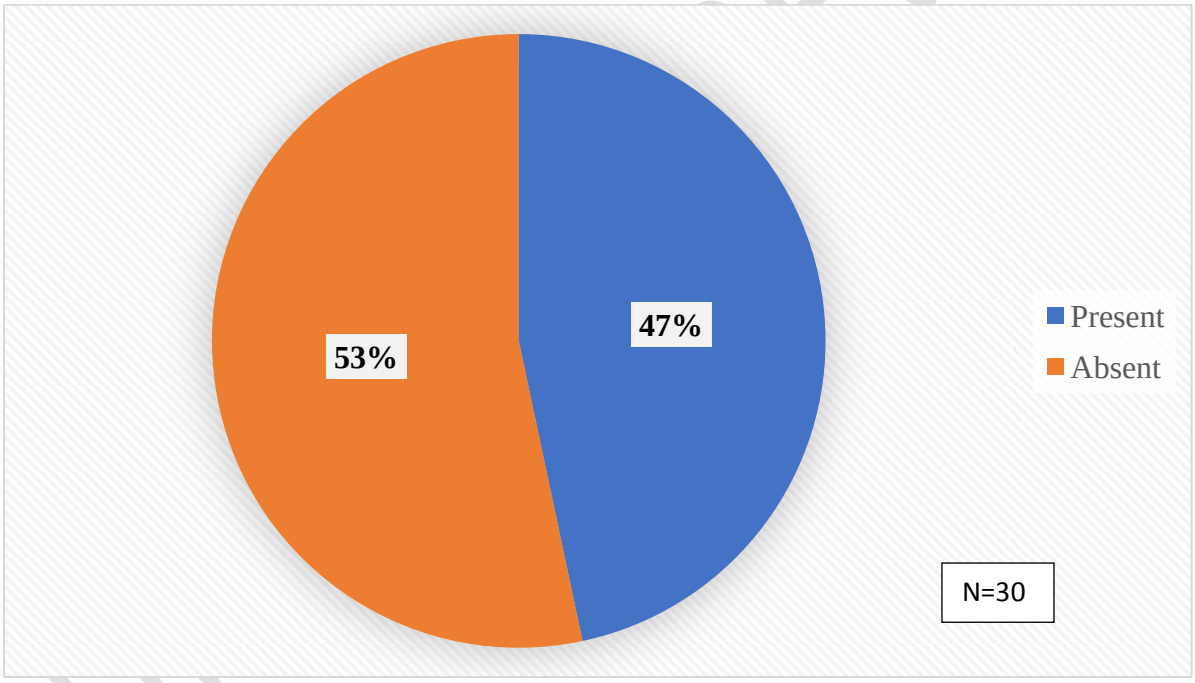

Table 2: Distribution according to proportion of complications among the study participants.

Complication	*Frequency*	*Percentage*
Postoperative fever	14	46.7
Surgical site infections	10	33.3
Anastomotic leak	2	6.7
Sepsis	2	6.7

Table 3: Comparison of mean albumin, haemoglobin values and duration of hospital stay among those having complications and those who did not.

Variable	*Complications*		*t value*	*df*	*P value*
	Present	***Absent***			
Albumin (g/dl)	3.04±0.19	3.82±0.31	8.028	28	0.001*
Haemoglobin (mg/dl)	9.68±0.95	11.46±1.89	3.172	22.79	0.003*
Duration of hospital stay (in days)	9.57±1.34	6.13±0.81	8.65	20.71	0.001*

*Statistically significant

Table 4: Correlation between serum albumin, serum haemoglobin and duration of stay in hospital.

	Haemoglobin	*Duration of hospital stay*
Albumin	0.755,0.001*	-0.839,0.001*
Haemoglobin	1	-0.640,0.001*
Duration of hospital stay	-0.640,0.001*	1

*Statistically significant