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Original Research Article

Role of preoperative nutrition in gastro-intestinal cancer patients: a prospective study

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ABSTRACT

Background: This prospective study was carried out to compare outcome and postoperative complication in patients with gastro-intestinal malignancy who received preoperative total parentral nutrition with those whom doesn't.
Methods: The study was a prospective single-centre, two-arm, conducted in department of general surgery, Gandhi Medical College and Associated Hamidia Hospital, Bhopal, Madhya Pradesh, India of one year duration, a total of 60 patients with G. I. malignancy, with or without sign of malnutrition, were included in the study. Patients were randomized and 30 patients were placed in each arm (interventional and control group) patients in the control group were asked to continue their normal feeding while interventional arm were given TPN in addition to their normal diet, for 7 to 10 days before surgery.
Results: Infectious complications were more in control group, while one case each of pneumonia and sepsis was observed in patients receiving supplementation. Complications related to nutritional status of the patient like wound infection and anastomotic leak were observed only in patients without supplementation. There was no death observed in interventional group but two deaths occurred in control group.
Conclusions: Preoperative nutritional support is beneficial and should be routinely used in abdominal and gastrointestinal cancer patient with or without clinical signs of malnutrition.

Keywords: GI malignancy, Malnutrition, TPN

INTRODUCTION

As far as gastrointestinal cancer patients are concerned, numerous randomized trials and guidelines on preoperative nutrition has been published.[1-7] All of them conclude that preoperative nutrition is beneficial and necessary for these patients. It improves their metabolic status and results in better postoperative outcomes, especially in terms of complications. According to European Society for Clinical Nutrition and Metabolism (ESPEN) guidelines, supplementation should be given for 10-14 days preoperatively, even if surgery has to be delayed.[2-4] The question, whether or not preoperative nutrition should be initiated in these patients is very important. Their metabolic status is often already affected by the disease related catabolism, which if uncontrolled, can lead to malnutrition. We have conducted this study to throw light on the question whether preoperative nutritional support should be routinely used in gastrointestinal cancer patients with or without signs of malnutrition, and if such approach will have positive clinical effects. Aim of the study was to compare

outcome and postoperative complications among two groups.

METHODS

The study was a prospective single-centre, two-arm, conducted in Department of General Surgery, Gandhi Medical College and Associated Hamidia Hospital, Bhopal, Madhya Pradesh, India of one year duration. A total of 60 patients with G. I. malignancy, with or without sign of malnutrition, were included in the study. 30 patients were placed in each arm (interventional and control group). All patients with GI malignancy between 18 - 80 years were included in the study. And patients with GI malignancy with comorbid medical conditions which may affect nutritional status, all immunocompromised patients were excluded from study.

Statistical analysis

The statistical analysis is done by chi-square test and student t-test. All patients were randomized into two groups. Randomization was based on a computer-generated simple randomization table prepared by an independent statistician.

Patients were randomized into interventional and control groups. Subjects in interventional arm were given TPN in addition to their normal diet, for 7 to 10 days before surgery. Patients in the control group were asked to continue their normal feeding.

No supplementations or changes in composition of their diet were made. Blood samples for laboratory tests albumin, total protein, and total lymphocyte count (TLC) were obtained. At the time of admission, following parameters were recorded: body weight, BMI, and various blood parameters. After surgery, depending on type of procedure performed, patients were given immediate nutritional intervention. After surgery all patients were followed-up for postoperative complications for 30 days.

RESULTS

The study was performed with 60 patients between the months of January 2015 to January 2016. Patients in control group suffered from higher number of infectious complications, ($p \geq 0.5$). However, one case each of pneumonia and sepsis (3.33% each) was observed in patients receiving supplementation.

Complications related to nutritional status of the patient like wound dehiscence (6.66%) and anastomotic leak (6.66%) were observed only in patients without supplementation. There was no death observed in interventional group but two deaths (6.66%) occurred in control group.

Table 1: Incidence of post op complications.

Complications	Interventional group (n = 30)	Control group (n = 30)
Wound infection	1 (3.33%)	4 (13.33%)
Wound dehiscence	0	2 (6.66%)
Sepsis	1 (3.33%)	0
Pneumonia	1 (3.33%)	0
Anstomotic leak	0	2 (6.66%)
Others (electrolyte imbalance, cardiac problems etc.)	1 (3.33%)	3 (10%)
Death	0	2 (6.66%)

DISCUSSION

Preoperative nutrition plays an important role in preoperative management of surgical patients. It helps to restore the nutritional status, which results in reduced number of postoperative complications. According to international guidelines, it should be given for 10-14 days before surgery. However, these guidelines generally apply to malnourished patients which require intensive nutritional support with specialized diets, often in hospital setting. According to the ESPEN guidelines, weight loss >10% in 6 months is a risk factor for postoperative complications and is borderline value for malnutrition. Even though this factor has been broadly studied, literature data on what level should be treated as threatening are inconsistent. Makela et al, in a case control study on a group of 44 left-sided colon cancer patients found statistically higher incidence of anastomotic leakage in subjects with weight loss >5%, which was also proven by Gregg to be a negative predicting factor for early postoperative death in patients with bladder cancer.[8,9] On the other hand, Antoun et al found higher incidence of severe post-operative complications in patients with over 15% weight loss.[10] Having in mind that cancer-related weight loss and deterioration is a long term and gradual process. We think that oral/TPN supplementation should be given to any cancer patient who suffered weight loss before surgery. It is also of utmost importance to screen each of these patients for malnutrition and nutritional risk, not relying only on weight loss.

The 7 to 10 days period of TPN supplementation seems to be the smallest necessary period to achieve such effect. We have given oral nutritional supplementation (ONS) to those patients who are not having sign of intestinal obstruction in addition to TPN. Oral nutritional supplements are generally very well tolerated, which results in higher compliance. Although many studies regarding compliance to ONS have been published so far, to our best knowledge only one systematic review has been made to summarize those studies.[11] Hubbard et al reviewed 46 studies of all types with 4,328 patients in which compliance to ONS was measured.[11] Those studies compared patients with various diseases (oncological,

geriatric, respiratory, renal, and fractures) receiving supplementation in ambulatory as well as inpatient setting. The overall compliance to prescribed ONS was 78% with most of studies (62 %) at the level of >75%. This high compliance was seen regardless of patient type, disease characteristics or healthcare setting. Even though in our study compliance to ONS was not calculated separately, it has been checked based on verbal response of our patients. We did not notice any significant noncompliance to the prescribed ONS, which corresponds with the results of cited studies.

Few authors have questioned superiority of immune modulating formulas in preoperative nutrition compared with formulas without these agents. In numerous studies, it has been shown that there were no differences in overall mortality, morbidity and cost-effectiveness between these approaches.[7,12] Some of them pointed out that timing of the nutrition is more important factor than its type. Klek et al in a randomized trial comparing different approaches towards perioperative nutrition showed that regardless of nutrition content, preoperative administration is of utmost importance to prevent postoperative complications.[13] Even though in our study the supplements used were without immune-stimulating agents, the biological effect achieved was similar to those, which used enteral immunoenriched formulas.

With nutritional supplementation, we managed to reduce number of surgical complications associated directly with one's nutritional status, such as anastomotic leakage.

CONCLUSION

Preoperative nutritional support is beneficial and should be routinely used in abdominal and gastrointestinal cancer patient with or without clinical signs of malnutrition. Such approach reduces the number and severity of postoperative complications, especially of anastomotic leakage, post-op wound infection and wound dehiscence well as duration of hospital stay and cost.

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