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Effect of Nutritional Supplementation in Patients Undergoing Major Gastro-Intestinal Surgery

Vimaladhithan Mahendran[1],Balakrishna Shetty[2]
[1]Resident In General Surgery, [2].Professor Of Surgery, K.S.Hegde Medical Academy
Vimaladhithan Mahendran, Door Number 222, Plot Number 84/10 6th Street, Janaki Nagar, Valasarawakkam, Chennai-India

Abstract: *Malnutrition is a serious problem in patients with gastrointestinal tract diseases. In those who have to undergo surgery for the malnutrition is a thorn in the flesh for patient as well as the surgical team. In recent years it has dawned that perioperative nutritional intervention in the form of oral or enteral feeding is far superior to the post operative total parenteral nutrition (TPN) therapy. Though the west has set specific guidelines for nutritional supplementation for gastrointestinal surgical patients, such practices have thus far been found wanting in India. The study enrolled 56 patients divided into two groups with one group receiving commercially available nutritional supplement starting preoperatively and continuing well into the postoperative period and even after discharge. The nonintervention group received nutritionist's advice but no supplementation. The patients were followed up for a period of one month. Biochemical, nutritional as well as clinical parameters such as serum albumin, weight, body mass index (BMI), postoperative complications and number of days in hospital were assessed. There was significant increase in the albumin of patients in the intervention group compared to non intervention group. The other parameters studied didn't show any statistical significance. We concluded that this would act as a pilot for bigger studies with larger sample size and more uniform institutional protocols to crystallize the need for early nutritional intervention in such patients.*

Keywords: *nutritional supplementation, gastrointestinal malignancies, enteral feeding, malnutrition universal screening tool*

I. Introduction

The problem of weight loss during hospitalization and following discharge home in cases of major gastrointestinal surgery and especially in cases of gastrointestinal malignancies is an established concept[1-4]. The time-honored practice of providing parenteral nutrition for patients undergoing major abdominal operations has started to loose its luster in the recent years. It is now begun to dawn that enteral nutritional is a much safer and more effective adjunct compared to parenteral nutrition[5,6]. There has been considerable body of evidence accumulating from recent studies showing that perioperative nutritional support positively affects this group of patients. A set of trials conducted by an Italian group analyzing the effects of pre-operative oral nutritional supplementation with immune-enhancing formula combined with postoperative jejunal feeding with the same formula in patients with major abdominal surgeries for malignancies showed significant reduction in postoperative infectious complications[7-10]. Several studies have found evidence of clinical benefits of supplementation of ward diet with oral nutritional supplements following surgery irrespective of pre-operative nutritional status[11,12].In India, cancers affecting the gastrointestinal tract are a cause for concern. According to the National Cancer Registry Programme (NCRP), esophagus was the leading site in Bangalore while stomach was the leading site in Chennai 35-64 y age group[13]. Above 65, mouth and stomach were the leading sites in all registries except Chandigarh[13].Unlike the west most patients diagnosed with such malignancies come from poor socioeconomic and educational background, hence many present with advanced lesions and prolonged periods of undernourishment. Thus it is imperative that effects of preoperative nutritional assessment and early nutritional supplementation should studied.

II. Methodology

This was an observational study conducted at Justice K.S.Hegde Charitable Hospital, Deralakatte, Mangalore, Karnataka, India. It was done after obtaining ethical committee approval from September 2014 to September 2016. A total of 56 patients were included into the study and were divided into two groups. Group A included patients who received oral nutritional supplementation along with dietary advice both preoperatively as well as postoperatively. Group B included patients who received only dietary advice but no nutritional supplementation. Dietary advice was given by the hospital dietician tailored to the patient's present nutritional status, comorbid conditions and the prolonged periods of fasting in the postoperative period. Nutritional

supplementation was given in the form of commercially available nutritional supplementation. Patients who satisfied the eligibility criteria were accepted into the study. Height, weight and BMI were calculated for all patients on admission. Laboratory investigations such as Hemoglobin, Total WBC Count, Serum Electrolytes, Serum Albumin and Total Protein were also done on admission. All the above measurements as well as investigation were repeated at 24 hours before the planned surgery, one week after surgery or before discharge (whichever came first). Same investigations were repeated on 2nd week and 4th week of the following month after discharge. Patients on admission were screened for malnutrition using Malnutrition Universal Screening Tool (MUST) and divided into Mild, Moderate or Severe Malnutrition. All patients were given a referral to nutritionist, the nutritionist assessed the patient and advised an appropriate feeding regimen to each patient based on patient's nutritional status, comorbid conditions, and route of feeding (enteral if oral is not feasible).

All patients who were planned to undergo elective major gastrointestinal surgery were included in the study. Those patients who did not proceed to the qualifying surgery, who underwent emergency surgeries and patients who received TPN were excluded from the study. The primary outcomes which were studied included weight, BMI, serum albumin, haemoglobin and total leucocyte count (TLC). Secondary outcomes included length of hospital stay, post operative infective complications including pneumonia, wound infections, abdominal abscess and non-infective complications including anastomotic leak, wound dehiscence, organ failure and thromboembolism.

III. Results

A total of 56 patients underwent nutritional assessment. Ten patients were excluded during study (6 patients received total parenteral nutrition during the study and 4 patients did not proceed to the primary surgery). A total of 46 patients met the inclusion criteria. Out of this 8 patients couldn't complete follow up.A total of 36 patients in the study were diagnosed with gastrointestinal malignancies.Meanweight at admission in group A (49.957 kg) increased to 52 kg at the end of 4 weeks after discharge(p=0.000 HS), whereas the mean weight in group B increased from 49.304 kg to 49.73 kg (p= 0.014 significant). The weight gain was marked between 7 days post-surgery to 4 weeks following discharge (p=0.007, HS). Statistically significant increase was seen in the BMI of patients belonging to both groups especially between post operative day 7 to upto 4 weeks after discharge. But the difference was more in patients belonging to group A compared to group B at 2 weeks and 4 weeks(p=0.040 and 0.32 respectively)**.** The overall mean BMI increased in both the groups but was more marked in group A from 19.804 at admission to 20.625 at the end of the study(p=0.000, HS) compared to 19.339 to 19.668 in group B(p=0.15, significant).The serum albumin of patients in both the groups improved significantly (group A p=0.001; group B p=0.000).It was noted that the hemoglobin values of patients in group A were low to at admission compared to group B, but they caught up with their counterparts on post operative day 7 and by the end of the study showed values higher than those in group B.There was a highly significant fall in the total leucocyte count of patients in both the groups. There was no perioperative mortality noted in this study**.** Complications were observed to be more in groupB (34.8%) compared to group A (17.4%). But there was no statistically significant difference between the two groups.Wound infection was seen in 2 patients in group A and 3 patients in group B. Respiratory tract infection was seen in 1 patient in group A and 2 patients in group B. Patients in group B also developed circulatory insufficiency(n=1), paralytic ileus (n=1)and bleeding (n=1)during the postoperative period. One patient in group A developed renal failure during the post operative period**.**During inter group analysis, majority of the patients in group A (47.8%) stayed for a period of 21-25 days in the hospital, whereas the majority of patients in group B (39.1%) remained in the hospital for 26-35 days.But on an average the mean number of days in hospital was almost similar (group A:23.57 days and group B: 23.47 days) and hence not statistically significant.

Conclusion

Perioperative nutritional support is has been proven internationally as an important adjunct in the overall management of major GI surgeries, especially GI malignancies. In this study the primary objectives namely length of hospital stay and complications did not have any significant difference between the two groups. As far as hospital stay is concerned, there was no uniformity in timing of discharges between six surgical units within the institution. It was mainly based on the decision made by the chief consultant of the respective surgical unit. Even though the non intervention group had twice the number of complications compared to the intervention group, the relatively small sample size could not prove a statistically significant difference between the two groups. The biochemical parameter such as the serum albumin as well as nutritional parameters such as weight and BMI showed significant improvement in both the groups, but patients in the intervention group fared better compared to their counterparts in the non intervention group. This was an observational study with a limited sample size which aimed at serving as a pilot study to assess the current trend and understanding of perioperative nutritional support at a tertiary care institutional setting in India. A more exhaustive investigation involving multiple disciplines along with a robust institutional protocol as regard to nutritional intervention and

designed as a randomized control trial will be the next obvious step in this direction. In order to extrapolate the findings of this study, a larger sample size along with a uniform institutional protocol for nutritional intervention is essential.

Ethical approval: "All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional ethics committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards."

Informed consent: Informed consent was obtained from all the participants included in the study

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