ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Comparative Study On Early Enteral Feeding And Delyaed Enteral Feeding.

A Sundarambal[1], SR Padmanabhan[1]*, and R Santhosh Kumar[2].

[1]Associate Professor, Department Of General Surgery, Government Medical College, Krishnagiri, Tamil Nadu, India.
[2]Assistant Professor, Department Of General Surgery, Government Medical College, Krishnagiri, Tamil Nadu, India.

ABSTRACT

Nutrients form the fuel for the body, which comes in the form of carbohydrates, proteins and lipids. The body is intended to burn fuels in order to perform work. Starvation with malnutrition affects the postoperative patients and patients with acute pancreatitis. There is an increased risk of nosocomial infections and a delay in the wound healing may be noted. They are more prone for respiratory tract infections. Enteral Nutrition (EN) delivers nutrition to the body through gastrointestinal tract. This also includes the oral feeding. This study will review the administration, rationale and assess the pros and cons associated with the early initiation of enteral feeding. The aim of this study is to evaluate if early commencement of enteral nutrition compared to traditional management (delayed enteral feeding) is associated with fewer complications and improved outcome.In patients undergoing elective/emergency gastrointestinal surgery. In patients with acute pancreatitis. It is also used to determine whether a period of starvation (nil by mouth) after gastrointestinal surgery or in the early days of acute pancreatitis is beneficial in terms of specific outcomes. A prospective cohort interventional study was conducted using 100 patients from July 2022to November 2022. At government medical college, krishnagiri, tamil nadu, india.Patients satisfying the inclusion and exclusion criteria were included in the study. Patients admitted in my unit for GIT surgeries or acute pancreatitis constituted the test group, while patients admitted in other units for similar disease processes constituted the control group. Our study concluded that early enteral feeding resulted in reduced incidence of surgical site infections. When the decreased length of stay, shorter convalescent period and the lesser post-interventional fatigue were taken into account, early enteral feeding has a definite cost benefit. CONCLUSION Early enteral feeding was beneficial associated with fewer complications and was cost-effective in the study.

Keywords: Early Enteral Feeding, Gastrointestinal (GIT) Surgeries, Acute Pancreatitis.

https://doi.org/10.33887/rjpbcs/2023.14.4.25

Corresponding author

ISSN: 0975-8585

INTRODUCTION

The human body is a well-oiled machine intended to burn fuel in order to perform work. Nutrients form the fuel for the body, and this comes in three flavours: carbohydrates, proteins, and lipids [1]. Starvation can adversely affect patients admitted in the surgical wards; more so in the post-operative patients and patients with acute pancreatitis. Those who are kept nil by mouth for extended periods, or have not begun eating by 14 days postoperatively have a significantly higher mortality rate than those who receive nutrition support very early [2]. This, coupled with the fact that malnutrition prevailed among many of the patients admitted in our tertiary health centre (most of them belonging to the lower socioeconomic status), the ramifications of these are overbearing. They eventually lead to a poor outcome. Worldwide studies show that 30% to 50% of hospitalized patients are malnourished, a condition associated with longer hospital stays, higher costs, and increased morbidity and mortality [3]. Patients with malignancies, chronic heart failure or in an immunocompromised state are at particularly high risk. Suppressed immune function can increase risk for nosocomial infections and delayed wound healing. Decreased muscle function can lead to reduced cardiac function and greater difficulty in weaning patients from ventilators. It can also increase susceptibility to respiratory tract infection. Appropriate use of nutritional support can greatly benefit patients in the surgical wards [4]. Enteral nutrition (EN) means using the GIT to deliver nutrition to the body. In the strictest of the definitions, this means that tubes are used at some level in the [5] gastrointestinal tract for feeding the patient; in this study, oral feeding is also incorporated in the definition, as in the broader sense this route also uses the gastrointestinal tract for nutrition. Parenteral nutrition on the other hand entails the administration of nutrients intravenously. This study will review the administration, rationale and assess the pros and cons associated with the early initiation of enteral feeding [6].

MATERIALS AND METHODS

A prospective cohort interventional study was conducted using 100 patients from July 2022to November 2022. At government medical college, Krishnagiri, Tamil Nadu, India. Patients satisfying the inclusion and exclusion criteria were included in the study, the source of the study being patients admitted in general surgery and surgical gastroenterology wards for either gastrointestinal surgeries or acute pancreatitis. The period of longitudinal observation was from July 2012 to November 2012. Inclusion and exclusion criteria were drawn up and only those patients satisfying both these criteria were included in the study. Patients admitted in my unit for GIT surgeries or acute pancreatitis constituted the test group while patients, while patients admitted in other units for similar disease processes constituted the control group. The sample size of the study was fixed at 100, the breakdown of which is as follows: Test group (TG) – Patients were pooled from my unit (25 patients undergoing GIT surgeries + 25 patients diagnosed with acute pancreatitis);Control group (CG) – Patients were pooled from neighbouring units (25 patients undergoing GIT surgeries + 25 patients diagnosed with acute pancreatitis).

Statistical Analysis

All the relevant data were collected and analyzed using SPSS (Statistical Package for Social Sciences) V.20. Independent 't' test and chi square test were calculated for analysis of the data. A 'p' value of <0.05 was regarded as a significant test value while 'p' > 0.05 was considered not significant.

RESULTS

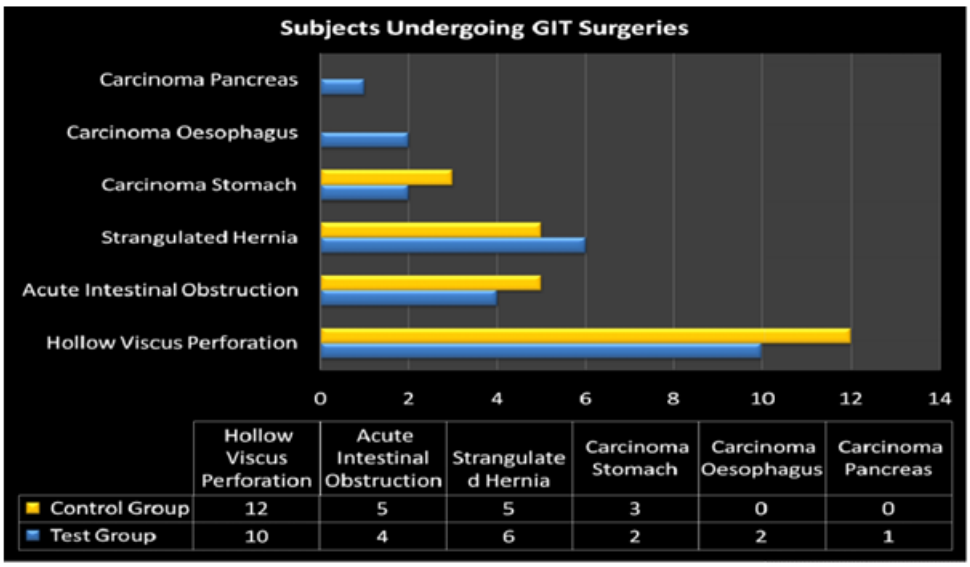
Table 1: Age Distribution

Age Groups	Test Group in GIT Surgeries	Group Control in GIT Surgeries	Test Group in Acute Pancreatitis	Control Group in Acute Pancreatitis
10 – 20 years	2	2	0	0
21 – 30 years	2	3	2	1
31 – 40 years	6	7	12	10
41 – 50 years	8	7	8	10
51 – 60 years	2	3	3	4
61 – 70 years	4	2	0	0
71 – 80 years	1	1	0	0

ISSN: 0975-8585

The average age of the patients undergoing GIT surgeries was 33.2 in the test group and 33.4 in the control group. The average age of the patients with acute pancreatitis was 38 in the test group and 37.8 in the control group. As it is evident , the two pairs of groups were similar to one another. The age distribution was also similar among the groups compared. The maximum age of a patient undergoing a GIT surgery in this study was 76, and the minimum age was 12. For patients with acute pancreatitis, the maximum age was 59 and the minimum age was 21.

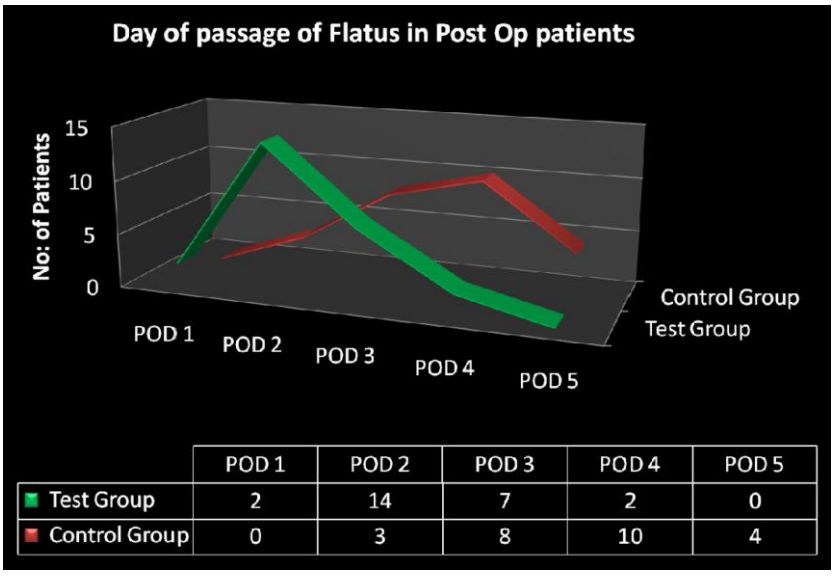
Graph 1: Breakdown of patients undergoing GIT surgeries



	Hollow Viscus Perforation	Acute Intestinal Obstruction	Strangulated Hernia	Carcinoma Stomach	Carcinoma Oesophagus	Carcinoma Pancreas
Control Group	12	5	5	3	0	0
Test Group	10	4	6	2	2	1

The most common cause for GIT surgeries (besides acute appendicitis, whichas excluded from the study) was hollow viscus perforation.Acute intestinal obstruction and and strangulated hernia were the other common causes. Both the test and control groups were comparable in the distribution of the disease process. p =0.04.

Graph 2: Days to pass flatus

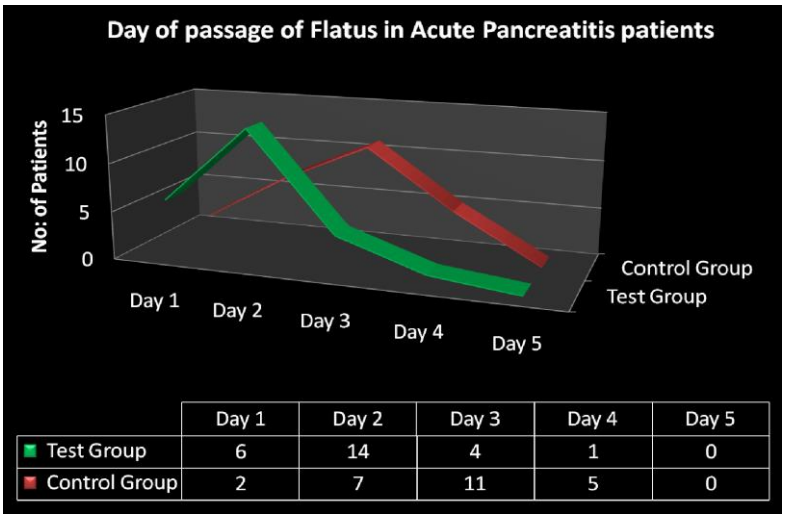


	POD 1	POD 2	POD 3	POD 4	POD 5
Test Group	2	14	7	2	0
Control Group	0	3	8	10	4

The most common cause for GIT surgeries (besides acute appendicitis, which was excluded from the study) was hollow viscus perforation. Acute intestinal obstruction and and strangulated hernia were the other common causes. Both the test and control groups were comparable in the distribution of the disease process. p = 0.04.

ISSN: 0975-8585

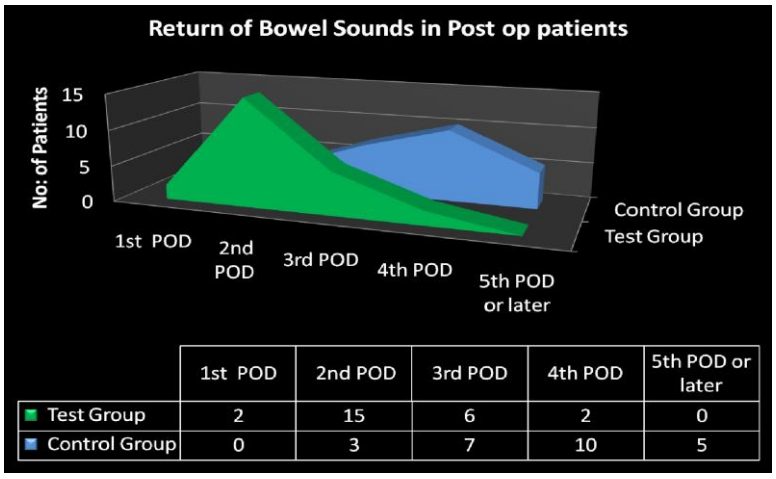
Graph 3



	Day 1	Day 2	Day 3	Day 4	Day 5
Test Group	6	14	4	1	0
Control Group	2	7	11	5	0

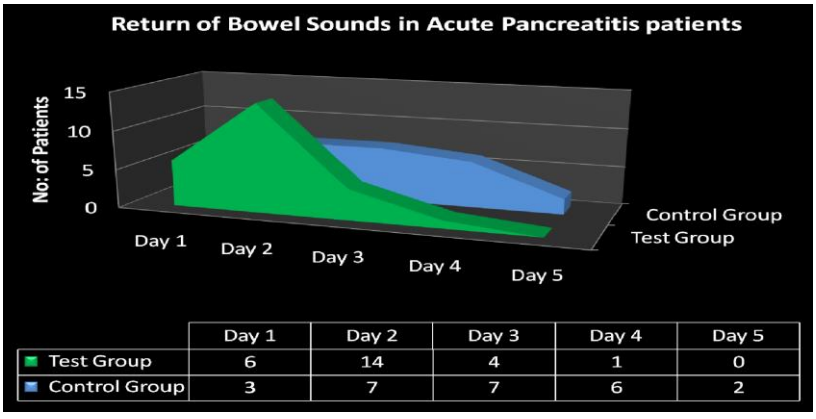
Flatus was passed by the 2nd or 3rd post-operative day among the patients undergoing GIT surgeries in the test group; the mean was 2.2 days (p=0.03). Among the control group, it was between 3rd and 4th Post operative day with a mean of 3 days (0.02).Among the patients with acute pancreatitis, the mean was 2.1 days in the test group (p=0.01), and 2.9 days in the control group (p=0.02).

Graph 4: Return of Bowel Sounds



	1st POD	2nd POD	3rd POD	4th POD	5th POD or later
Test Group	2	15	6	2	0
Control Group	0	3	7	10	5

Graph 5: Return of bowel sounds in acute pancreatitis patients



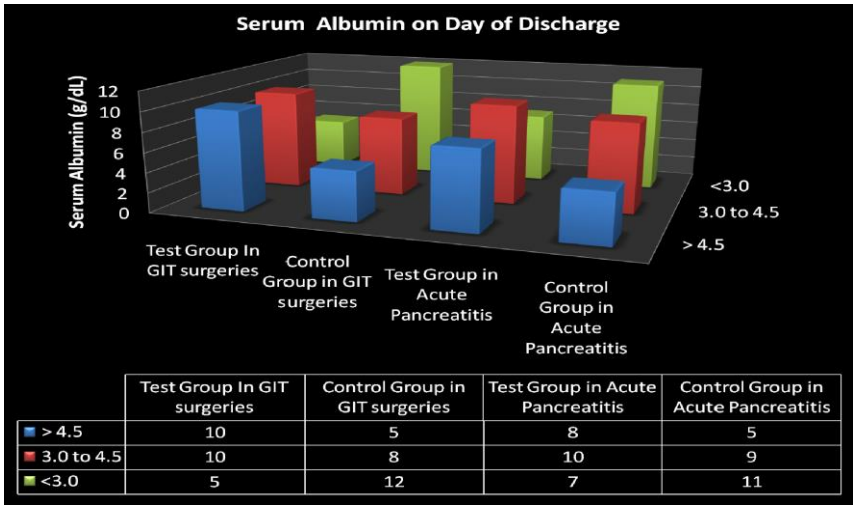
	Day 1	Day 2	Day 3	Day 4	Day 5
Test Group	6	14	4	1	0
Control Group	3	7	7	6	2

Bowel sounds returned between 2nd and 3rd POD among the test group patients, undergoing GIT

ISSN: 0975-8585

surgeries; mean was 2.3 days (p=0.03). Among the control group, it was between 3rd and 4th POD; mean= 3.4 days (p=0.02).In patients with acute pancreatitis, mean return of bowel sounds was 1.8 days in the test group (p=0.02); among the control group, mean was 2.9 days (p=0.01).

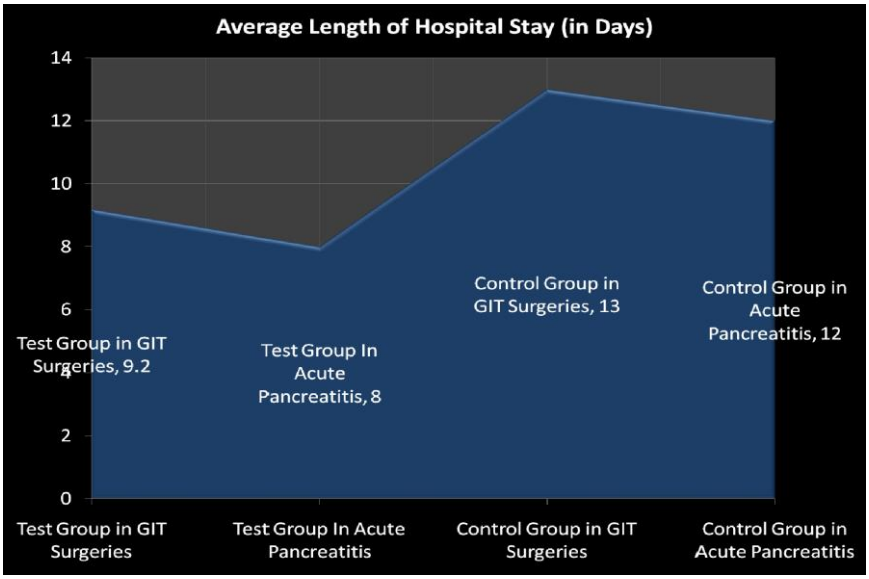
Graph 6: Serum Albumin



	Test Group In GIT surgeries	Control Group in GIT surgeries	Test Group in Acute Pancreatitis	Control Group in Acute Pancreatitis
> 4.5	10	5	8	5
3.0 to 4.5	10	8	10	9
<3.0	5	12	7	11

Serum albumin is a useful indicator of acute changes. In fact, the 30 day risk of mortality is often gauged by the serum albumin level. In the study, serum albumin was measured at the time of admission, on the 5th post-intervention day and at the time of discharge. The test group patients in both GIT surgeries and acute pancreatitis and higher serum albumin levels on the day of discharge when compared with controlgroup. The graph and the statistically significant. In the above table substantiate it.

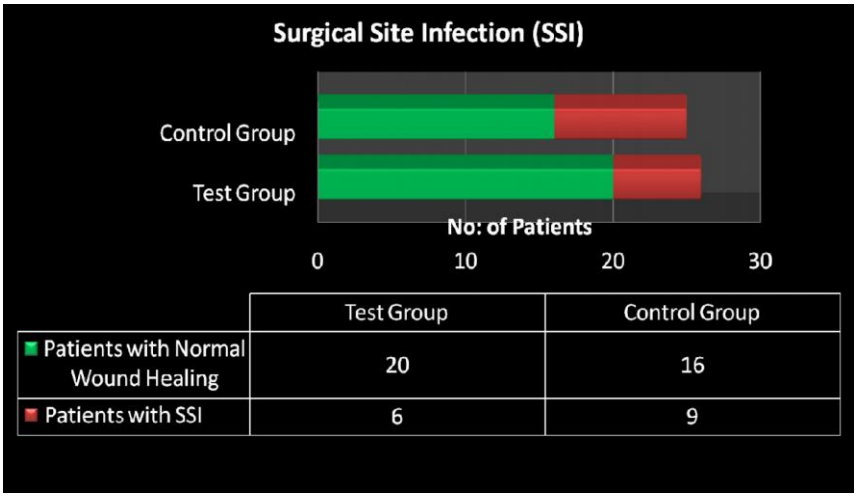
Graph 7: Length of Stay (LOS)



The average length of stay in the test group in GIT surgeries was 9.2 days while in its control group, it was 13 days. (p =0.03). The average LOS in patients with acute pancreatitis was 8 days in the test group and 12 days in its control group (p = 0.02).

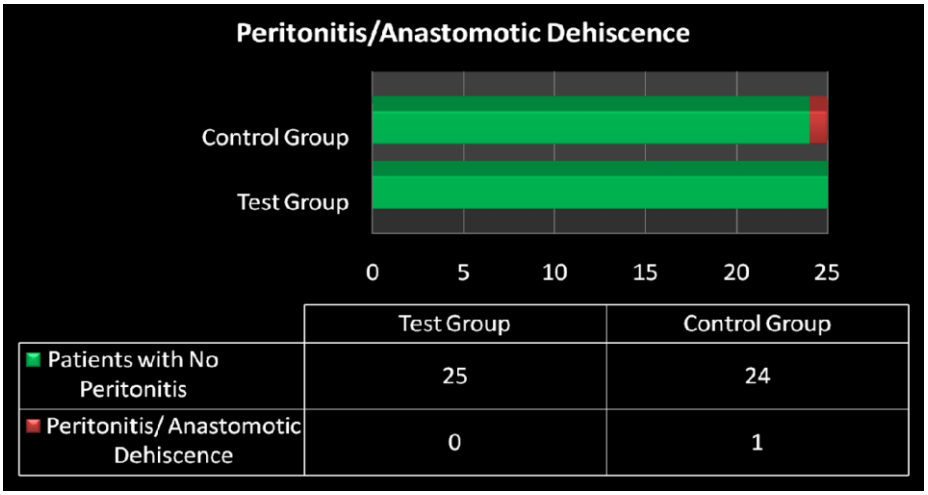
ISSN: 0975-8585

Graph 8: Surgical Site Infection



The number of patients with SSI was 6 in the test group and 9 in the control group. Though it did not reach statistical significance (p = 0.08), the infection rate was nevertheless lesser in the test group.

Graph 9: Anastomotic Dehiscence/ Peritonitis



Overall, there was only one case of anastomotic dehiscence in the control group, with no such cases in the test group. It did not reach statistical significance (p = 0.09).

DISCUSSION

The traditional method of initiation of enteral nutrition was to begin when the bowel movements have started or the patient had passed flatus. Patients were maintained on dextrose-containing IV fluids and kept NPO for up to 7 days until evidence of bowel function returned [7]. But collective data suggests that the presence of bowel sounds and the passage of flatus or stool are not absolute prerequisites for initiation of enteral nutrition. In fact in this study the mean return of bowel sounds in the test group undergoing GIT surgeries was 2.32 days (Control group – 3.4 days) while among the patients with acute pancreatitis it was 1.8 days. (Control group – 2.9days). Both achieved statistical significance.[8] This is brings us to a causality dilemma – "which situation leads on to the other? Should enteral feeding be delayed until the bowel starts functioning or does early feeding cause the bowel to resume its function normally?" Clearly, the results in the study show that early enteral feeding does at some level hasten the normal bowel function [9]. A point that must be stressed at this juncture is that an ileus must be distinguished from more ominous conditions, such as an obstruction. A prolonged ileus may be the result of intra-abdominal pathology [10]. Western literature is replete with studies that show that healthy patients without malnutrition undergoing uncomplicated surgery can tolerate 10 days of partial

starvation (i.e., maintenance intravenous fluids only) before any clinically significant protein catabolism occurs. But in a public health system in a developing nation like ours, malnutrition is the norm. Patients are more often than not are undernourished and present in a late stage of the disease process. Earlier nutritional intervention is likely indicated in these patients with poorer preoperative/pre-interventional nutritional reserves. The attempt here is to decrease the amount of catabolism and protein breakdown, something that cannot be certainly don't with delayed initiation of feeding. The basic feature is that with enteral feeding the liver gets the first pass at the nutrients and thus promotes appropriate and economic processing of proteins (Fischer)[11,12]. A very frequent argument for delayed initiation of enteral feeding is that a newly constructed anastomosis must be rested before food passes through it. But itmust be reiterated that the gut secretes and reabsorbs approximately 7L fluid irrespective of oral intake; so "protecting the anastomosis" is based on a false premise. The anastomosis remains secure and is not put to any increased risk of leakage with early enteral feeding [13,14]. Furthermore studies have delineated that the prompt administration of nutrition enterally promotes the restoration of GI mucosa integrity in malnourished patients; in stark contrast to this is parenteral nutrition where such a benefit is not observed. This is because with TPN the GI mucosa continues to be permeable, in spite of the nutritional status improving [15]. As opposed to the prevalent notion, early enteral feeding is both well tolerated and decreases the rate of post-intervention complications significantly. It minimizes the risk of undernutrition and can nullify the hypermetabolic response seen after surgery. Hence the consensus now is that in malnourished patients in the surgical wards, enteral feeding is ideal if they have a functioning GI tract [16]. The shorter the recovery period of the patient in the hospital, the better it is. This was definitely the case in this study were length of stay (LOS) in the hospital was comparatively less among the test group. Moreover, the days to return to normal diet was also less among the test groups. These patients also had a greater weight gain and lesser post interventional fatigue when compared with the control group. All this equates in to a shorter convalescent period and a healthier patient on the day of discharge [17]. Since parenteral feeds were not included in the study, the actual cost effectiveness could not be compared. Nevertheless, the average cost of the enteral feeds per day was around 65 rupees. This is in stark contrast to parenteral formulas, which cost around 2000 rupees per feed. When the decreased length of stay, shorter convalescent period and the lesser post-interventional fatigue were taken in to account, early enteral feeding has a definite cost benefit. It can partly be attributed to the overcautious nature of the practitioners in an effort to leverage certain known and unknown factors that could jeopardize the early recovery of the patient. This over cautiousness is not entirely misplaced. Once the abdomen is closed or the ports are removed, the surgeon becomes "blind" again so to speak! If given the opportunity, he wouldn't mind strapping on an ultrasound probe to the patient and find out the most infinitesimal changes in the homeostasis.[18]. But that is not practical, feasible, nor warranted. Over cautiousness or over indulgence on investigations is not an ideal substitute for a sound knowledge, surgical techniques and observation [19,20].

CONCLUSION

Early enteral feeding was beneficial, associated with fewer complications, and was cost effective in the study. Nutrition is now regarded as a medical intervention, and this was aptly personified by Thoma Edison - The doctor of the future will no longer treat the human frame with drugs, but rather will cure and prevent disease with nutrition. If the gut works, use it. This is the theory behind early enteral feeding.

REFERENCES

[1] 110 Doctor. Gastrointestinal anastomosis:
[2] Accessmedicine.com (2009) Access Medicine | Features. [online] Available at: http://accessmedicine.com.
[3] Afalbotra A. Mathur AK. Gupta S. Early enteral nutntion after surgical treatment of gut poibmtions: A Prospective randomized study. JPOM 2004;50:102-106
[4] Beier-liolgersen K Boesby S. Influence of postoperntiv enteral nutrition on postsurgical infections. Out 1996;19:831415
[5] Bijlani Nutrition as a limb of energy metabolism. Understanding Medical Physiology 2004:449-453
[6] Braga 84, Vignal; A. Gianoni I, et al Immune and nutritional effects of early enteral nutrition after major abdominal operations Eur J Surg 1996.162:105.112
[7] British journal of surgery. (2012) [online] Available at: http://bjs.co.ok

[8] BRUNICARDI, F. C., & SCHWARTZ, S. I. (2005). Schwartz's principles of surgery. New York, McGraw-Hill, Health Pub. Division.
[9] Bufo Al. Feldman S. Daniels GA. Lieberman RC. Early postoperative feeding. Dis Colon Rectum 199437:1260-5.
[10] Butte K. Kehler II. Epidural anesthesia and analgesia: Effects on surgical stress responses and implications for postoperative nutrition Clin Nutt. 2002: 21:199.
[11] Canon D Liu. David W. McFadden. Preoperative and Postoperative Management: Nutritional it %ca ment. Michael J. Zama, Seymour I.Schwan Harold El/is. Manses Abdominal Operation. Appleton & Lange Stamford. CT: 1997; 465-466.
[12] Cheatham ML, Chapman WC, Key SP, Sawyers II., A h/eta-anal,isis of seective versus routine nasogastric decompression. Ann Surg 1991;215:503- 513
[13] Christensen .1! Intestinal motor physiology. In Feldman M. Scharehmidt BE, Sleisenger MB: Gastrointestinal and Liver Disease Pathophysiology rniagnosist Mermgcment. 6 cd. Vol. 2. Philacklubia, Vai Saunders. 1998, pp.I437-145
[14] Conte/in S Cm. K D Eddie ling. Paul Iloulos cc al. Randomized trial of sally and efficacy of immediate postoperative enteral feeding in patients undergoing gastrointestinal resection. BM 1996;312:869-871
[15] Cruyson and Flail. Dietary balances: Regulation ot feeding; Obesity and starvation: Vitamins and mineral. text Book of Medical Physiology. Ye Li Saunders company. Singapore 2000;718-721.303-821
[16] Devidson's Principal and Practice of Medicine. Edinburgh London NY PA Sydney loronto. Churchill Livingstone; 1999;510
[17] CY Dwyer S. Michic H, Ziegler 1'. Rcvhaug A. Smith R. Wilmore 1). A single dose of endolosin increases intesvina/ permeability in healthy hunians_ Arch Sum 1988123:145944 Arnd Schidte-Bockhoff Marion Sabin, and Michael Kcymling. A randomi/ed prospective trial of immcdiale vs. MCI day feeding after pereutancou.s CadOSCOpie gastrostomy in intensive cure patients. Intensive Care Medicine, 2002134:1473-5
[18] EBERLEIN, T. J. (2012). The Washington manual of surgery. Philadelphia, Lippincott Williams & Wilkins.
[19] Edward L. Steven E. Stephen F. Systemic reponse to injury and metabolic support: Slaw-anis P6 nc ipl es of Surgery. USA:2005;5-38
[20] Feig BW, Berger DH, & Fuhrman GM. 2006. The M.D. Anderson surgical oncology handbook. Philadelphia, Lippincott Williams & Wilkins.