GSC Advanced Research and Reviews

eISSN: 2582-4597 CODEN (USA): GARRC2

Cross Ref DOI: 10.30574/gscarr

Journal homepage: https://gsconlinepress.com/journals/gscarr/

(RESEARCH ARTICLE)

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Early feeding following elective laparotomy with gut anastomosis in surgical patients

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GSC Advanced Research and Reviews, 2023, 14(03), 027–037

Publication history: Received on 26 December 2022; revised on 16 Februay 2023; accepted on 19 February 2023

Article DOI: https://doi.org/10.30574/gscarr.2023.14.3.0030

Abstract

Background: Early oral feeding has been listed as one of many factors that contribute to enhancing recovery after laparotomy due to its effect on postoperative ileus.

Objectives: The aim of the study was to compare early feeding against controls on the reduction of postoperative ileus among patients undergoing elective laparotomy.

Methodology: Consenting patients who had elective laparotomy with gut anastomosis in the Surgical wards of NAUTH Nnewi were randomised into Early feeding group and Control/ traditional delayed feeding group. In the Early feeding group, patients' NGTs were removed within first 24 hours and graded oral intake was commenced. In the Delayed feeding group, patients were used as controls and were managed in the traditional way-nil by mouth until passage of flatus or faeces. Assessed outcome measure was time from completion of surgery to passage of flatus and faeces.

Results: During the study period, December 2014 to November 2016 (2 years), 72 consenting patients who had elective laparotomy in the Surgical wards were randomised into the two groups- Group1 (n=36); Group 2 (n=36). The groups were similar in terms of gender, age, surgical procedures, and co morbidity. The age range was 20-81 years. The time from completion of surgery to first passage of flatus was 3.85days for Group1 and 3.92days for Group 2. Time from completion of surgery to first passage of stool was 4.57days for Group 1 and 4.76days for Group2. The time to flatus and faeces was shorter in early feeding compared to Controls but did not reach statistical significance (p0.115, p0.116 respectively). There were no significant differences noted in the complication rates among the groups.

Conclusion: There was no statistically significant difference in the time to passage of flatus and faeces between the Early oral feeding group and controls.

Keywords: Laporotomy; Anastomosis; Ileus; Nasogastric tube(NGT)

1. Introduction

The catabolic response following abdominal surgeries may be significant and may lead to overall increased morbidity[1]. It has been shown to lead to immune compromise, diminished muscle strength, delayed wound healing, fatigue, prolonged convalescence[1,2] The total nitrogen loss after major elective abdominal surgery ranges between 40g and 80g of nitrogen (1 to 2 kg of lean body mass) and may increase to 150g in the case of complications or poor nutritional support[3]. Maintenance of nutrition may minimize catabolism and therefore argues for adequate perioperative nutrition[3]. A major deterrent to postoperative nutrition is Postoperative ileus (POI). It is defined as the transient inhibition of normal gastrointestinal motility following abdominal surgery, typically lasting for 3-5 days[4]. It is an inevitable response to surgical trauma where the different areas of gastrointestinal tract resume function at different

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times[4]. After surgery, inhibited motility of the GIT is related to disorganized electrical activity and lack of coordinated propulsion[5,6]

Withholding oral intake from patients for a few days following abdominal surgery has been the standard postoperative management for well over l00years[7]. This practice is thought to have developed in response to the high rates of postoperative emesis experienced by patients anaesthetized with such agents as ether and chloroform[7]. Delayed postoperative feeding involves keeping the patient strictly nothing by mouth and on nasogastric intubation until bowel movement is established. When the patient begins to regain bowel function, defined as the passage of flatus or stool, a clear liquid diet is started. When the patient tolerates the clear liquids, a semisolid diet, comprising foods such as custard, pap is allowed. When these foods are tolerated, a regular diet is started, and only after being able to consume and tolerate this, the patient is discharged.

The idea of food passing the fresh anastomosis is a prime source of anxiety for the surgeon as bowel contents or induced peristalsis could probably disrupt the anastomosis[3]. This is a valid concern given the morbidity associated with an anastomotic leak. Furthermore, with large proportions of patients experiencing ileus secondary to bowel manipulation and anesthesia, concern exists that the digestive tract would probably not tolerate the feedings, resulting in nausea, vomiting, and aspiration. Patients are therefore made to await the return of some bowel activity before being allowed oral feeding. Historical doctrine (oral restrictions, use of nasogastric tubes) and pathophysiologic concerns (postoperative ileus, risk of anastomotic dehiscence, nausea and vomiting) invoked for not instituting early oral feeding after abdominal procedures, though believed to protect the patient are not founded on scientific evidence[3]. The gastrointestinal system secretes up to eight liters of fluid daily, even without any feeding which traverse an anastomotic site and is readily absorbed in the small intestine. Therefore, postoperatively the gut tolerates high volumes of fluid and feeding may have no additional adverse effect on the post operative gut[8,9].

In spite of new evidence, most surgeons still refrain from instituting early oral feeding. Delayed oral intake after abdominal operations is still widely practiced. The traditional practice of nasogastric intubation and waiting for return of bowel function before gradual progression of diet may be strenuous to the patient[3] and causes discomfort[10]. Several complications of prolonged nasogastric tube placement have been described including sinusitis, iatrogenic gastric perforation, nasal trauma, nasal hemorrhage, esophageal ulceration, gastroesophageal reflux, fluid and electrolyte imbalances, aspiration pneumonia, psychological problems[10]. Early oral feeding due to its effect on postoperative ileus has been shown to enhance early postoperative recovery and avoid unnecessarily prolonged starvation and nasogastric tube complications[11,12]. Early food intake increases concentrations of gastrointestinal hormones. It stimulates gastrointestinal motility through the gastrocolic reflex in early postoperative patients as it does in healthy controls[13]. This should help to shorten postoperative ileus. Prompt postoperative oral feeding has been shown to be both safe and well tolerated[10]. It also prevents patient discomfort from prolonged nasogastric tube (NGT) irritation and hypothetically attenuate the injury stress response.

Aim and objectives

The aim of the study was to compare early feeding against controls on the reduction of postoperative ileus among patients undergoing elective laparotomy with gut anastomosis admitted through surgical clinics. Post-operative ileus was assessed by duration from end of surgery to passage of flatus and faeces

Specific objectives included

- To assess time from end of surgery to passage of first flatus and faeces in patients on early feeding protocols and controls.
- To compare patient satisfaction for each intervention using simple YES or NO answer questions.

2. Material and methods

The study was conducted over a period of 2 years, from December 2014 to November 2016. Subjects considered for the study were all consecutive patients admitted through surgical clinics in Nnamdi Azikiwe University Teaching Hospital NAUTH Nnewi, who had elective laparotomy with gut anastomosis. Only Adult patients, 18 and above, patients who gave consent were selected. Exclusion criteria include- Laporotomy patients who had no gut anastomosis; Patients who did not consent, were unwilling, or unable to accept randomization e.g. senile dementia, confusion, encephalopathy; 4.

Patients with a high risk of aspiration (for which patient is admitted to ICU) - coma, patients requiring respiratory support; Patients with deranged SEUC results; Patients with objective evidence of severe sepsis or multiple organ

dysfunction All study protocols and informed consent forms were approved by the Research and Ethical Committee of N.A.U.T.H. Written informed consent was obtained from considered subjects who were then included in the study having met inclusion criteria.

Clinical assessment included a detailed history and physical examination. Patients were adequately investigated and lesions localized using abdominopelvic ultrasound scan, computerized tomography scan, colonoscopy or barium studies. Serum electrolytes, Urea and Creatinine (SEUC) estimations were done ensuring normal results. Haemograms were also performed ensuring a Hb of above 10g/dl. Patients with jaundice were optimized to Childs Pugh class B or better. All patients were ASA 4 or better and had normal SEUC.

All laparotomies were done by a Senior Resident General Surgeon or a Consultant General Surgeon. General anaesthesia with endotracheal intubation was used for all cases. Each anastomosis was done in two layers using synthetic absorbable Polyglactin 910 Vicryl 2/0 sutures, batch number HB2471. Time at end of abdominal wound closure was documented. Intramuscular Pentazocine 30mg 8hourly was used for all patients for analgesia. Each enrolled subject was allocated a number in a concealed sequence in a computer-generated randomization plan known as Stratified randomization sampling (strata software) to ensure that the population in the two groups were similar.

Each patient was randomized to either- Early feeding group (Group 1, n = 40) or the Control / Traditional delayed feeding group (Group 2, n= 40) by the above-mentioned software and allocated by the researcher. The nature of the study did not allow blinding after application of the assigned intervention postoperatively. To accurately monitor the time of first flatus and faeces, patients were educated on the methodology of the study and were instructed to notify nurses or study investigators immediately after they passed gas. They were given pieces of paper pasted beside them to write down the time or have a care-giver or knowledgeable relative or staff do this.

Intervention was commenced once patient had fully recovered from effects of anaesthesia. The patients were reviewed three times daily assessing for ileus symptoms, complications and to specifically collect data. A standard proforma was used for recording each patients details. The participants were followed up until discharged from hospital.

2.1. Group 1 patients

Early oral feeding group: Nasogastric tube was removed within first 24 hours after the operation and graded oral intake was commenced with 20ml of water orally every 3hours. The amount was increased as tolerated to 50ml then 100ml with progression to tea then pap or custard (semisolid diet). Patients without complications were then progressed to solid diet over next 24hrs. Intravenous infusion was maintained until oral intake was fully established.

2.2. Group 2 patients (Control group)

Nasogastric tubes were left insitu until passage of flatus. They were on nil per os and were started on clear oral fluids only on passage of flatus with progression to normal diet as tolerated. All patients were maintained on I.V. fluids and broad spectrum antibiotics. Patients were monitored additionally for nausea, vomiting, abdominal distention, abdominal wound dehiscence, anastomotic dehiscence by the researcher and trained medical personnel. Patients were additionally observed for complications of nasogastric intubation- blockage, severe throat discomfort, dislodgement, nasal trauma at reintubation. The primary end point in the study was time to first postoperative passage of flatus, this being a surrogate marker for recovery from postoperative ileus. Secondary end points include time to first defecation and tolerance of feeding protocol.

3. Results

Over a period of 2years, a total of 80 patients fit the inclusion criteria and were recruited, forty (40) patients in each group.

Eight (8) patients, who failed to complete the study, were excluded- Two (2) patients died, who belonged to the Control Group and died of pulmonary embolism and renal failure. Two (2) patients from the Control group were non-compliant with the feeding protocols. Four (4) patients in the early feeding group, did not tolerate the early feeding protocol (Cross-over group) and were also excluded from the study. Seventy two (72) patients completed the study as shown in **Table 1.**

Table 1 Number of patients in each group

Group	No. of patients
Group 1	36
Group 2	36
Total	72

The age range of the subjects was 20-81 years. Mean age of 56.24± 15.77years.. No significant difference was noted among the groups. Sex incidence for the groups were as follows: 18male:18 female in Group 1 and 17 male:19 female in Group 2 **(Table 2).**

Table 2 Group distribution based on gender

Group	Gender	Frequency	Percent
Late feeding (Grp 2)	Female	17	47.2
	Male	19	52.8
	Total	36	100.0
Early feeding (Grp 1)	Female	18	50.0
	Male	18	50.0
	Total	36	100.0
Total		72	100

Table 3 Anatomical region of surgeries in all groups

Group	Nature of surgery	Frequency	Percent %
Late feeding (Grp 2)	Colonic surgery	21	58.3
	Small gut surgery	11	30.6
	Gastroduodenal surgery	4	11.1
	Total	36	100.0
Early feeding (Grp 1)	Colonic surgery	18	50.0
	Small gut surgery	16	44.4
	Gastroduodenal surgery	2	5.6
	Total	36	100.0
Total		72	100

Main indications for surgery in both groups were colostomies, pancreatic cancer, caecal / ascending colonic cancer, sigmoid tumour, gastric tumours, omental and mesenteric tumours. The commonest operations performed were Colostomy reversals with colo-colonic anastomosis; gastrojejunostomy and cholecystojejunostomy (double bypass); right hemicolectomy. Anatomical distribution of surgeries in each group is as shown in Table 3.

The mean duration of operation was 131.22 ± 53.13 minutes in Group 1and 108.32 ± 31.15 minutes in Group 2 (Table 4). In terms of co-morbid disease (Table 5), 3 (8.3%) had Diabetes Mellitus, 7(19.4%) had hypertension, 3 (8.3%) had Diabetes mellitus and hypertension and 2 (5.5%) had Kochs disease in Group 1. In Group 2, 5(14.7%) and 3(8.3%) had Diabetes mellitus respectively, 6(16.7%) had hypertension in each group, 2(5.5%) had both Diabetes mellitus and

hypertension in each group, 1 patient had Kochs disease. No significant difference in co-morbid disease was noted between the groups.

The main outcome measure-Time from abdominal closure to first passage of flatus was not statistically different between Group 1 and Controls (5551.17±1105.88 vs. 5362.36±1114.25 p0.115) Table 6. Also there was no statistical difference between the groups as regards time to first passage of faeces (6860.47±1353.63 vs. 6587.58±1254.92 p0.116) Table 7. Time to passage of flatus and faeces in days is shown in Tables 8 and 9.

Table 4 Mean duration of surgery

Group	Mean duration of surgery in minutes	F*	P value
Group 1	131.22 ± 53.13	2.730	0.07
Group 2	108.32 ± 31.15		

F* = one way Analysis of variance

Table 5 Co morbid disease

Co morbidity	Earlyfeeding Grp 1 (%)	Latefeeding Grp 2 (%)
Diabetes mellitus	3 (8.3%)	3 (8.3%)
Hypertension	7 (19.4%)	6 (16.7%)
Diabetes mellitus + Hypertension	3 (8.3%)	2 (5.5%)
Kochs diseases	2 (5.5%)	0 (0%)
Total P=0.10	15	11

Table 6 Mean time to passage of flatus in minutes

Group	Mean time in Minutes ± standard Deviation	P value*
Control vs Group1	5362.36±1114.25 5551.17±1105.88	0.115

Table 7 Mean time to passage of faeces in minutes

Group	Mean time in Minutes ± standard Deviation	P value*
Control vs Group 1	6587.58±1254.92 6868.47±1353.63	0.116

Table 8 Time to passage of flatus in days

Group	Mean time in minutes ± standard variation	Time in days
Early feeding	5551.17 ±1105.88	3.85
Late-feeding	5362.36 ±1114.25	3.92

Table 9 Time to passage of faeces in days

Group	Mean time in minutes ± standard variation	Time in days
Early feeding	6860.47±1353.63	4.57
Late-feeding	6587.58±1254.92	4.76

There were no statistically significant differences noted in the complication rates among the groups **(Table 10).** Postoperative complications observed were abdominal distension, nausea, vomiting, NGT-related complications-blockage, dislodgement, severe throat discomfort. There was no anastomotic dehiscence in any of the groups.

In Group1 **(Table 11),** 9 patients had complications. Five (5) patients had 1 episode of vomiting. These patients were continued on early protocol as scheduled. Four (4) patients had abdominal distention, 1 also vomited, for the 3 others, distension was non-progressive and resolved spontaneously.

Table 10 Observed complications

Type of complication	Group 1	Group 2	P value
Nil complication	26	22	0.078
Complications*	10	14	0.084
Vomiting	5	4	
Abdominal distension	4	2	
Anast. Dehiscence	0	0	
Blocked nasogastric tube	0	6	
Dislodged tube	0	4	
Nasogastric tube trauma	0	1	
Severe throat discomfort	0	4	

*Some patients had more than 1 complication

Table 11 Group1 complications

Complication	Number of patients
Vomiting	5
Abdominal distension	3
Abdominal distension & vomiting	1
Anastomotic dehiscence	0
Nasogastric tube complications	0
Total	9

In the Control group, 13 patients had complications **(Table 12).** Six (6) patients had blocked nasogastric tubes; two had associated abdominal distension and vomiting. These nasogastric tubes were suctioned, readjusted or removed and reinserted. There were 4 dislodged tubes in the group; one was pulled out following severe throat discomfort; three dislodged spontaneously; one patient sustained nasal haemorrhage during attempt at reinserting. Two other patients complained of severe throat discomfort and one of vomiting which resolved spontaneously.

Table 12 Control group complications

Complication	Number of patients
Vomiting	1
Blocked NGT	3
Vomiting & blocked NGT	1
Vomiting, abdominal distension & blocked NGT	2
Dislodged NGT	2
Severe throat discomfort	2
Severe throat discomfort & dislodged NGT	1
Dislodged NGT & trauma	1
Anastomotic dehiscence	0
Total	13

In our assessment of patient satisfaction during the feeding protocols, patients were asked if they would allow similar postoperative management next time (as depicted in **Table 13)** 23(63%) patients said 'YES' in Group 1 and 22 (61.1%) would recommend similar management for a relative or friend. In the Control group, 25 patients (69%) said 'NO' to a similar protocol in future and 26 (72%) would not recommend to a friend or relative.

Table 13 Patient satisfaction with each feeding protocol

Question	Early feeding	Late feeding	P value*
Would you allow similar post op management in case of repeat surgery?			
Yes	23	13	0.04
No	13	25	
Would you recommend similar post-op management for a relative or friend?			
Yes	22	10	0.03
No	14	26	

*significant at ≤0.05

4. Discussion

The prevalence of gastrointestinal disease among patients attending General Surgery clinics in our study was 25.1%. The number of patients seen with colorectal carcinoma in the surgical clinics over the period of study was 26 (17.3 patients per year). These figures are slightly higher than those obtained in the same Teaching Hospital by Anyanwu[14], 10 years ago. In the same geographical zone, Eastern Nigeria, Nwafor and Ojukwu[15] in 1980 reported 36 patients with colorectal cancer over a 7 year period (5.1 patients a year) in University of Nigeria Teaching Hospital (UNTH) Enugu which then had Nnewi in its catchment area. The time trend of colorectal cancer in Eastern Nigeria over the past 40 years shows a gradual increase and will result in a gradual paradigm shift in general surgical practice. Appreciation and development of methods of improving postoperative recovery following elective laparotomy for gastointestinal surgical disease can only be a step in the right direction.

Length of time from abdominal wound closure to first passage of flatus in the early feeding group in our study was 3.85 ± 0.76 days (3.92 ± 0.77 days for controls). Time from abdominal wound closure to first passage of faeces was 4.57 ± 0.82 days (4.76 ± 0.94 days for controls). Our results show that early feeding reduced the length of postoperative ileus but the difference was not statistically significant. This was similar to the studies by Reissman et al[16], Han-Geurts et al[17], Feo et al[18] and Klappenbach[19]. Reissman et al[16] showed that inspite of the similarity in duration of ileus in both early feeding and control groups, the patients in the early feeding group tolerated a regular diet significantly earlier than the patients in the Control group. They attributed this finding to the earlier resolution of gastric and intestinal ileus whereas

colonic motility was still absent. Feo et al[18] supposed that the opioid-based analgesic regimen employed in both the early feeding and late feeding groups was responsible for this result, due to its very well known constipating effect on the gastrointestinal tract. Opioid-based analgesics were used routinely and the effect was not evaluated in our study.

Our study showed similar lengths of time from surgery to passage of flatus and faeces between the early feeding and control groups. However patient satisfaction, as assessed by simple YES/NO- answer questions, was more in the early feeding group compared to controls who had nasogastric tubes with nil by mouth until passage of flatus or faeces. Few patients would argue that a nasogastric tube is one of the most unpleasant aspects of their postoperative course. Several studies have attempted to quantitate patient discomfort, but this is subjective and difficult to assess[20-23]. Bashey and Cuschieri[24] used visual analogues in assessing patient comfort after upper abdominal surgery with nasogastric intubation. Cheadle et al[25] reported significantly more pain and frequency of swallowing, and nose/throat discomfort in their nasogastric tube group. The psychological impact of oral fluids and food following surgery was considered by Schilder et al[26] and an improved sense of well-being was observed in the patients who ate sooner. As one author points out, this positive psychological aspect and its potential impact on the recovery process must not be overlooked[16]. Nil by mouth and nasogastric intubation is associated with morbidity and discomfort and nasogastric tube can also easily be dislodged[9, 18]. Several studies have also described sinusitis, injury to the vocal cords, and iatrogenic gastric perforation, nasal trauma, nasal hemorrhage, laryngeal injury, esophageal ulceration, gastroesophageal reflux, fluid and electrolyte imbalances, aspiration pneumonia, feeding dysfunction, and psychological problems [18, 27, 28] Cutillo et al[29] observed hindered deglutition and nasal soreness caused by the nasogastric tube in 88% of patients in their intubated group. Re-insertion of a nasogastric tube was necessary in six (10%) patients in the early feeding group, this figure was same as in our study.

Studies are few in Sub-Saharan Africa as regards the benefits of early postoperative oral feeding in the reduction of time from surgery to passage of flatus and faeces and effectively POI control. However, Abantanga[30] in Ghana suggested that nasogastric tube decompression after laparotomy in children may be safely dispensed with after full recovery from anaesthesia. He demonstrated that oral sips can be started immediately after removing the NGT (within 24 hours), even in children who had undergone resection of bowel and anastomosis. He also demonstrated that children with the NGT taken out within 24 hours after abdominal procedures start full oral feeds earlier and are discharged home sooner than children who are managed routinely with the NGT in situ for several days. Ocen et al[31] in Kampala, Uganda advocate selective suction following abdominal surgery and early introduction of oral intake. Their study also suggested it was safe and associated with postoperative reduction of morbidity, a quicker recovery and a shorter hospital stay than the use of routine nasogastric decompression and nil by mouth. Sholadoye et al[32] in Zaria, Nigeria concluded that early oral feeding following intestinal anastomoses in children is safe particularly in the setting of limited availability of parenteral nutrition. Orji et al[33] and Ajuzieogu et al[34] both showed that early oral feeding (and gum-chewing) after caesarean section was safe and well tolerated and have beneficial effects on early return of bowel function. Our study agrees with these assertions.

In our study, out of an initial 40 patients in the early feeding group, 36 patients (90%) tolerated the early feeding protocol. This was similar to a study by Cutillo et al[29] in which 95% tolerated early feeding and one by Nathan and Pain[20] in which 98% of the early feeding group tolerated the protocol. Dag et al[8] also reported 85.9% tolerance in the Early feeding group. Nakeeb et al[35], Difronzo et al[36] and Petrelli et al[37] reported tolerance of 75%, 80% and 73% respectively in their early feeding groups. Intolerance was defined as repeated vomiting, more than 2 episodes without bowel movement by Reissman et al[16] and Nakeeb et al[35] this was same as in our study. The intolerant patients formed the Cross-over group, had nasogastric tubes reinserted and were excluded from the study. The remaining 36 patients tolerated the early feeding protocol and completed the study.

There were no statistically significant differences in overall complication between the groups. This was consistent with findings of Dag et al[8], Han-Geurts et al[17] and Koukouras et al[38]. Ten patients (10) had complications in the Early feeding group; 14 patients had complications in the Late group p0.084. In the Early feeding group complications included nausea, vomiting and abdominal distention. Anastomotic leakages occurred during excision and anastomosis of lower or ultra-lower rectal tumors in the studies by Nakeeb et al[35] and Zhou et al[10]. This is probably more directly related to the inherent difficulty with anastomosis of the gut in this part of the abdodmen than to the feeding protocol. In our study, there were no low anterior resections or ultra low anterior resection and there was no incidence of anastomotic dehiscence. Moreover, studies show that the passage of food at the anastomotic site enhances healing, reduces the risk of developing fistulas and anastomotic wound dehiscence by increasing local blood flow and peristalsis, thus stimulating intestitinal motility and resolution of postoperative ileus[39,40,41]. In the Late feeding group, there were also nasogastric tube complications. Koukouras et al[38], Cutillo[29] and Nathan[20] reported high incidences of sore throat and nasogastric discomfort in the traditional feeding group undergoing nasogastric decompression.

Our study observed nasogastric tube-related complications requiring repeated manipulation or handling of the nasogastric tubes in the intubated patients in the late feeding groups. It also demonstrated that although the incidence of abdominal distension and vomiting presents in the absence of nasogastric decompression, patients may develop these complications even with a nasogastric tube in place. In a recent meta-analysis of 26 clinical trials, 8.2% of selectively decompressed and 8.3% of routinely decompressed patients developed abdominal distension, whereas 10.I% of selectively decompressed and 8.5% of routinely decompressed patients developed vomiting[42]. Bauer et al[21] eliminated nasogastric decompression as a routine adjunct to patient care following abdominal surgery. Its use being only indicated in selected cases. Cheatham et al[42] advocated selectively placing nasogastric tubes in only those patients who develop a need for decompression in the postoperative period. Four patients required reinsertion of nasogastric tubes in our study, this further corroborates the fact that nasogastric tubes though not required as routine may be required for selected cases.

The study was time-bound and conducted over a two year period. A much longer duration of study with a larger sample size would draw more meaningful conclusions from the study. With a much larger sample size same surgeries may be compared, instead of fewer patients with varied operations. Outcomes will be better compared.

5. Conclusion

Our study shows that there is no benefit in keeping patients nil by mouth after gastrointestinal surgery. Time to resolution of ileus was similar between the early oral feeding group and controls. Patients had similar complications but felt better compared to controls. Early patient recovery and subsequent discharge following early resolution of postoperative ileus may have multiple benefits—including cost effectiveness and improved efficiency of the healthcare system in the face of low hospital capacity, poor health-care facilities, overwhelmed medical workforce in a resource-limited country like Nigeria.

Recommendation

From the study, the following recommendations are being made

- Nasogastric tubes should be removed and oral intake can be commenced early following elective abdominal surgeries with gut anastomosis. Patients must be observed closely for tolerance and selective reinsertion practised
- Larger and non time-bound multi-Centre studies should be carried out comparing the different feeding protocols among large groups of patients.
- Enhanced recovery after surgery (ERAS) protocols, which evidence-based management strategies are known to improve postoperative outcome, should be adopted in our practise.

Compliance with ethical standards

Acknowledgments

We wish to acknowledge other consultants and senior residents in General surgery in Nnamdi Azikiwe University Teaching Hospital , Nnewi Nigeria that operated on the patients used in this study. We also acknowledge the nurses in male and female medical wards that helped us to collate the data

Disclosure of conflict of interest

There is no conflict of interest to report.

Statement of ethical approval

This study was approved by Nnamdi Azikiwe University Teaching Hospital Nnewi ethics and research committee,

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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