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Original Research

Effect Of Early Versus Delayed Enteral Feeding In Case Of perforation peritonitis

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Abstract

Introduction and aim - Following gastrointestinal surgery, there has been a tendency among surgeons to delay enteral feeding in order to allow the operated site more time to heal and to avoid complications like leaks, infections, and abscess formation but early enteral feeding is believed to diminish stress response, improve immunity and wound healing, and significantly lower the risk of sepsis. Thus the present study aimed to study the effect of early vs delayed enteral feeding in patients of perforation peritonitis. **Material and method-** This Prospective comparative study including 60 patients that were included only after approval from institutional thesis and ethical committee. All cases were randomly (pick a slip from bucket) divided into 2 groups. Group A (Early feeding group): patients were allowed orally within 48 hrs after surgery. Group B (Delayed feeding group): patients were allowed orally after appearanceof bowel sound, passage of flatus/stool. All patients assessed daily with regards to- Nausea and vomiting, Abdominal distension determined by clinical examination. **Result -** The mean time for RT removal was significantly longer in delayed feeding group B individuals than in early feeding group A cases (93.60±18.21hr vs. 29.60±10.32hr, p 0.001). Mean time for passage of flatus was significantly shorter in group A as compared to group B (48±22.27 hr vs 78.40±32.10 hr, p 0.001).Mean drain output was 58.63±19.28 ml in group A and 79.83±22.09 ml in group B. This analysis was statistically significant (p 0.001). Serous content in drain was found in 90% of patients in each group while faecal content was only 10% in each group (p 0.545).The mean drain removal time was 4.89±2.30 days for group A and 8.22±3.14 days for group B, which was statistically significant (p 0.001). **Conclusion –** Over all complicationrate was morein case swith delayed feeding group B.

Key Word- Gastrointestina, Immunity, Abdominal.

introduction

Perforation peritonitis is the most common surgical emergency in India. In early 20th century 90% of deaths were attributed to secondary peritonitis and it's still reported to be 30 to 35% in spite of emergence in antibiotics, radiological imaging, surgical methods and resuscitation therapy.[1] Surgery is almost always indicated for perforation peritonitis, though in stable patients with radiologic scans showing a sealed perforation, nonsurgical treatment can be used. Emergency surgery and aggressive supportive care is of utmost importance to reduce the mortality.[2] Response to surgical trauma includes various endocrine, metabolic and immunological changes. Following major trauma, emergency surgery, sepsis or burns, these changes are accentuated, resulting in SIRS (systemic inflammatory response syndrome), with hypermetabolism, marked catabolism, shock and even MODS (multiple organ dysfunction syndrome). The body frequently suffers from intense catabolic effects. The catabolic condition, contributes to muscle breakdown and a reduction in energy reserves, will make recovery longer. Maintaining metabolic equilibrium as early as feasible and reducing the catabolic effect will help prevent negative metabolic repercussions and speed up recovery from surgery. These reasons make nutritional supplementation during perioperative

care crucial to the healing process.[3] The standard postoperative nutritional strategy involves giving patients nothing by mouth until their bowel movements resume and leaving a nasogastrictube in place till return of bowel movement. Once bowel function is recovered and the nasogastric tube is withdrawn, clear liquid is started and advanced as tolerated. The conventional method of oral feeding, which relies on the auscultation of normal bowel sounds and the passage of flatus and bowel movement is not supported by radiologic or physiological research on humans or animals but it is still used as a confirmatory signal for restoration of bowel movement. [4,5] The idea behind oral fluid restriction after laparotomy is that prolonged intestinal handling or gastrointestinal surgery can result in a significant paralytic ileus. POI (post operative ileus) symptoms include nausea, vomiting, abdominal distention, abdominal pain, and delayed passage of flatus and stool.[6] There is no need to delay feeding out of concern for leaks though if saliva, digestive juices, and intestinal juices pass through the operated site without leaking.[7] Numerous studies of the literature demonstrate that it is safe to start feeding right away following gastrointestinal anastomosis because it is more physiological and avoids changes in the gut caused by morphologic and functional stress and, in addition to being less costly than complete parenteral feeding, aids in the modulation of immunological and inflammatory responses.[8] Enteral feeding is believed to diminish stress response, improve immunity and wound healing, and significantly lower the risk of sepsis. Most likely, this is accomplished via promoting enterocyte proliferation, which enhances the function of the mucosal barrier and reduces bacterial translocation.[9] So, the present study aimed to compare the effect of early versus delayed enteral feeding in case of perforation peritonitis presented in a tertiary care hospital.

MATERIAL AND METHODS

This Prospective comparative study including 60 patients was conducted in Department of General Surgery, Govt medical college and Hospital, Patiala. The patients were included only after approval from institutional thesis and ethical committee and informed consent of the patient is taken. All cases were randomly (pick a slip from bucket) divided into 2 groups. Group A (Early feeding group): patients were allowed orally within 48 hrs after surgery. Group B (Delayed feeding group): patients were allowed orally after appearance of bowel sound, passage of flatus/stool. Semisolid diet introduce in both groups when they tolerate to free fluid.

Inclusion Criteria: Age > 5 years with proper written informed consent of the patient suffering

from gastrointestinal perforation for which primary closer has been done.

Exclusion Criteria: Age < 5yr, Patients who refused to give consent, Immunocompromised

patients, Patients with renal failure, Patients with spinal injury, Patients who needs critical

care, Re laparotomy, Patient with stoma as surgical management for perforation peritonitis.

Method

All 60 cases were taken up for study and patients were subjected to detailed history and thorough physical examination. Patients were undergo investigations - CBC, RFT, LFT, RBS, PTI. Serum Electrolyte, Viral marker. X-ray Abdomen and chest / USG Abdomen/Pelvis CT-Abdomen (as and when required). All diagnosed patients were subjected to surgery. Primary closer was done depending upon the size of perforation. A detailed proforma was developed and recorded information demographic including patients age, sex, detailed examination, investigations, procedure done and operative finding.

All patients assessed daily with regards to- Nausea and vomiting, Abdominal distension determined by clinical examination. Abdominal pain determined by VAS score. Operated site leak determined clinically (Temperature and drain content), Intra-abdominal collection assessed clinically (fever, abdominal pain, abdominal distension), Drain output, Appearance of 1st bowel sound, Passage of flatus, Length of hospital stay. End point of study was tolerance of early enteral feeding after surgery, post operative recovery and morbidity. Tabulation of cases were done. Data obtained was compiled and analyzed using statistical package of social science(SPSS 16.0 version)

OBSERVATIONS

RT was removed when amount of content was less than 20ml-30ml/day for last 24-48 hr and content was gastric. In 76.67% of patients RT were removed on 24hr following surgery in group A. however in 43.33% of patients RT were removed on 96hr following surgery in group B. The mean time of ryles tube removal in group A was 29.60±10.32hr while in group B it was 93.60±18.21hr. The difference between both groups regarding their mean time of ryles tube removal was statistically significant (p 0.001). In our study 80% patients of group A and 70 % patients of group B had mild postoperative abdominal pain following enteral feeding. Moderate abdominal pain was found in 20% in group A and 30% in group B. Mean VAS score was found 3.05±1.05 in group A and 3.16±0.89 in group B. Comparison in between two groups was statistically

insignificance with p value 0.65313.33% (4/30) of patients in group A and 20% (6/30) patients of group B had postoperative abdominal distension. Compared to group A, group B has a greater incidence of postoperative abdominal distension. The difference in rate of postoperative abdominal distension was statistically insignificant in bothgroups (p 0.107).

Table 1: RT Removal Time wise Distribution in two groups

RT Removal	Group A		Group B	
	Patients	Percentage	Patients	Percentage
24Hours	23	76.67%	0	0%
48Hours	7	23.33%	0	0%
72Hours	0	0%	10	23.33%
96Hours	0	0%	13	43.33%
120Hours	0	0%	7	23.33%
Total	30	100%	30	100%
Mean± SD	29.60±10.32		93.60±18.21	
p-value	0.01			

Table 2 - Comparison of abdominal pain, distension and passing of flatus between group 1 and 2

ABD Pain (VASSCORE)	Group A		Group B	
	Patients	Percentage	Patients	Percentage
1-3(mild)	24	80%	21	70%
4-7(moderate)	6	20%	9	30%
8-10(severe)	0	0%	0	0%
Total	30	100%	30	100%
Mean± SD	3.05±1.05		3.16±0.89	
t-test	0.45 2			
pvalue	0.65 3			
ABD Distension	Group A		Group B	
	Patients	Percentage	Patients	Percentage
Yes	04	13.33%	06	20%
No	26	86.67%	24	80%
Total	30	100%	30	100%
χ^2	2.56			
pvalue	0.17			
Flatus(Hours)	Group A		Group B	
	Patients	Percentage	Patients	Percentage
24Hours	07	23.33%	0	0%
48Hours	10	33.33%	0	0%
72Hours	11	36.67%	15	50%
96Hours	0	0%	07	23.33%
120Hours	0	0%	05	16.67%
NOTPASSED	02	6.67%	03	10%
Total	30	100%	30	100%
Mean±SD	48.00±22.72		78.40±32.10	
pvalue	0.001			

Table 3 - Comparison of Intra-abdominal collection, Drain output, drain content and Drain removal between group 1 and 2.

IAC	Group A		Group B	
	Patients	Percentage	Patients	Percentage
Yes	03	10%	03	10%
No	27	90%	27	90%
Total	30	100%	30	100%
χ^2	0.370			
p-value	0.543			
Output(Avg.)ml	Group A		Group B	
	Patients	Percentage	Patients	Percentage
≤50 ml	12	40%	06	20%
≥51 ml	18	60%	24	80%
Total	30	100%	30	100%
Mean± SD	58.63±19.28		79.83±22.09	
p-value	0.001			
Drain Content	Group A		Group B	
	Patients	Percentage	Patients	Percentage
Serous	27	90%	27	90%
Faecal	03	10%	03	10%
Total	30	100%	30	100%
χ^2	1.212			
p-value	0.545			
Drain Removal	Group A		Group B	
	Patients	Percentage	Patients	Percentage
≤5 Days	24	80%	04	13.33%
6-10Days	03	10%	17	56.67%
≥11Days	01	3.33%	06	20%
Not Removed	02	6.67%	3	10%
Total	30	100%	30	100%
Mean± SD	4.89±2.30		8.22±3.14	
t-test	4.497			
p-value	0.001			

Table 4 - Comparison of appearance of Ist bowel sound and patient's hospital stay between group 1 and 2

BS(Hours)	Group A		Group B	
	Patients	Percentage	Patients	Percentage
24Hours	14	46.67%	06	20%
48Hours	14	46.67%	12	40%
72Hours	02	6.67%	08	26.67%
96Hours	0	0%	04	13.33%
Total	30	100%	30	100%
Mean±SD	38.40±14.91		56.00±23.01	
p-value	0.001			
Stay (Days)	Group A		Group B	
	Patients	Percentage	Patients	Percentage
1-5Days	05	16.67%	0	0%
6-10Days	21	70%	16	53.33%
11-15Days	04	13.33%	11	36.67%
16-20Days	0	0%	3	10%
Total	30	100%	30	100%
Mean±SD	7.13±2.47		10.80±3.46	
p-value	0.0 1			

The mean time of passage of flatus in group A was 48.00±22.72hr and in group B was 78.40±32.10hr. The difference of the mean time for passage of flatus between two groups was statistically highly significant (p 0.001). Intra-abdominal collection (IAC) was assessed clinically and further by ultrasonography. incidence of intra-abdominal collection was 10% in each group. Comparison in between groups was statistically insignificance as p-value for this study was 0.543.The mean output was 58.63±19.28ml in group A and 79.83±22.09ml in group B. There was a statistically significant difference in the mean drain output between the two groups (p 0.001). Serous fluid in drain was found in 90% of patients in each group of study. Faecal content in drain was found in 10% patients in each group. Comparison in between groups showed that distribution of drain content was statistically insignificant (p 0.545). Drain was removed when amount was less than 20ml/day for 2-3 days and content was serous in each group. the mean time of drain removal in group A was 4.89±2.30 days, whereas in group B, it was 8.22±3.14 days.

Drain was not removed in 6.67% (2/30) of patients in group A and 10% (3/30) patients in-group B as drain content was faecal in these cases. The difference between two groups, in terms to their mean time of drain removal was statistically highly significant (p 0.001). Feeding was started in-group A irrespective of bowel sound. In groups A and B, the mean time for the bowel sound to appear was 38.40±14.91 hours and 56.00±23.01 hours, respectively. There exists a statistically significant difference (p 0.001) in the timing of bowel sound appearance between group A and group B. n both groups majority of patients stay between 6-10 days. In group A, the mean duration of stay after surgery was 7.13±2.47 days, however in group B, it was 10.80±3.46 days. The mean duration of postoperative hospital stay in group B is higher compared to group A which was found to be statistically highlysignificant (p 0.001).

DISCUSSION

In present prospective study, total 60 patients were randomly divided into two groups of 30 individuals in each group . Group A: patients were allowed orally within 48 hrs after surgery.Group B: patients were allowed orally after appearance of bowel sound, passage of flatus/stool. RT was removed when amount was less than 20ml-30ml/day for last 24-48 hr and content was gastric. In present study, the mean time of ryles tube removal in group A patients was 29.60±10.32hr, whereas in group B, it was 93.60±18.21hr. The difference between the both groups, is statistically significant(p value 0.001) In a study by **Chatterjee et al** [10] (2012), the average time to remove a nasogastric tube (NGT) was 48.8 hours (SD–20.71) for patients in group A and 68 hours (SD–17.77) for patients in group B. There is a statistically significant difference (p value 0.00000028) between the two groups.In present study, 13.33% (4/30) of patients in group A needed reinsertion of Ryles tube due to abdominal distension and removed in 1 patient within 48 hr when abdomen was soft and nondistended following which feed was started and RT was continued in other 3 patients. In group B 20% (6/30) of patients needed reinsertion of Ryles tube who develops abdominal distension and removed in 3 patients (within 48hr) when abdomen was soft and nondistended and RT was continued in remaining 3 patients. In present study, postoperative abdominal pain after starting of enteral feed was assessed by using VAS score. 80% patients of group A and 70 % patients of group B had mild (VAS score 1-3) postoperative abdominal pain. Moderate (VAS score 4-7) abdominal pain was found in 20% patients of group A and 30% patients of group B. The mean VAS score for groups A and B was 3.05±1.05 and 3.16±0.89, respectively.Comparison in between groups was statistically insignificance with p value 0.653. Postoperative abdominal pain was reported by **Masood A et al** [11] was94.1% in group A and 94.7% in group B. In present study, 13.33% (4/30) patients in group A and 20% (6/30) patients in group B had postoperative abdominal distension. All these patients needed reinsertion of ryles tube for drainage. All 4 patients of group A found to have low serum K+ level postoperatively and 3 patients had IAC. Ryles tube was removed in 1 patient after reinsertion when abdomen become soft and nondistended and ryles tube was continued. Various study in past like **Kishore et al** [12] concluded 2.7% (1/37) patient having abdominal distension in each groups. **Sundar et al** [13] found 6.6% (2/30) patients in group A and 3.3% (1/30) patients in group B had postoperative abdominal distension. In terms of postoperative abdominal distension, they found that there was no significant difference between the two groups (p>0.05). The study found that the mean time for flatus passage was 48.00±22.72 hours for group A and 78.40±32.10 hours for group B. This analysis was statistically significant (p value 0.001). The mean time for passage of flatus was determine to be comparable to that of **Nakeeb et al**[14] and **Chatterjee et al**[10] in which group A cases were able to pass flatus more quickly as compared to group B cases (p<0.05). In present study, 10% (3/30) patients in each group had postoperative Intra-abdominal collection. Regarding intra-abdominal collection, there was no statistically significant difference between the two groups (p value 0.543). According to **Sheth JY et al** [15] there was no statistically significant difference between the both groups in terms of post-operative intra-abdominal collection rates 3.33% (1/30) versus 6.67% (2/30) (p>0.05). In our study mean drain output was 58.63±19.28 ml in group A and 79.83±22.09 ml in group B this analysis was statistically significant (p value 0.016). In 90% patients drain content was serous and 10% patients drain contentwas faecal in each group which was statistically not significant (p value 0.545)

In our study mean time of drain removal was 4.89±2.30 days in group A and 8.22±3.14 days in group B. this analysis was statistically significant (p 0.001). An intraabdominal drain was placed in 37% patients of the study group and 40% patients of control group in study done by **Stewart et al**[16] on early feeding following elective open resections and anastomosis. All anastomotic leakage in both groups was detected by the drain, and in certain instances, this resulted in faecal or bilious discharge from either the major abdominal wound orthe drain site.

In present study group A had significantly shorter duration for appearanceof bowel sound (38.40±14.91hr) than group B (56.00±23.01hr) (p 0.001).A statistically significant similar analysis was also observed by a number of earlier studies like **Nakeeb et al** [14] **Chatterjee et al**[10] and **Bajwa et al**[17].The mean length of the postoperative hospital stay in group A was 7.13±2.47 days while in group it was 10.80±3.46 days. This difference was statistically significant (p 0.001). The duration of hospital stay in this study is similar to that of earlier studies, including those conducted by **Nakeeb et al**[14] **Chatterjee et al**[10] **Bajwa et al**[17] and **Soni DK et al**[11] Furthermore, the results are statistically significant.

All of these studies, including the current one, have found one important finding that post-operative hospital stays are noticeably shorter in group A than those of group B. It can be primarily because early feeding promotes earlier bowel movements, a quicker recovery, fewer complication following surgery, and early mobilization, which results in an earlier hospital discharge.

CONCLUSION

This prospective comparative study concluded that early feeding after gastrointestinal surgery for perforation peritonitis has better outcome than delayed feeding in terms of lower complications like abdominal pain, abdominaldistension, wound infections, mortality but nausea & vomiting was higher. IAC, Rate of repair leakage and re-exploration was equal in both groups. Duration ofRT and drain removal, passage of flatus and appearance of bowel sound was significantly shorter in early feeding group. Drain output was significantly low and post operative serum albumin levelwas significantly higher in early feeding group. Early feeding was well tolerated by patients and enables significant shorter length of hospital stay. However, we need a larger multi-centric study with larger sample size to demonstrate statistically significant difference in the outcomes to further validate the study findings.

REFERENCES

1. Qadan M, Dajani D, Dickinson A, Polk HC., Jr. Qadan M, Dajani D, Dickinson A, Polk HC., Jr. Meta-analysis of the effect of peritoneal lavage on survival in experimental peritonitis. Br J Surg. 2010;97(2):151–9. 16.
2. Anner TN, Hall BR, Oran J. Pneumoperitoneum. Surg Clin North Am. 2018Oct;98(5):915-32.
3. Plank LD, Hill GL. Sequential metabolic changes following induction of systemic ınflammatory response in patients with severe sepsis or major blunt trauma. *World J Surg.* 2000;24:630–63
4. Livingston EH, Passaro EP. Postoperative ileus. Dig Dis Sci 1990;35(1):121- 132
5. Bufo AJ, Feldman S, Daniels GA, Lieberman RC. Early postoperative feeding. Dis Colon Rectum 1994; 37(12):1260-1265
6. Woods JN, Erickson LW, Condon RE et al. Postoperative ileus: a colonic problem. Surgery 1978; 84:527-33.
7. Lewis SJ, Egger M, Sylvester PA, Thomas S. Early Enteral feeding versus “nil by mouth” after gastrointestinal surgery: Systemic review and meta-analysis of controlled trials. British medical journal. 2001;323(7316):773 .
8. Thapa PB, Nagarkoti K, Lama T, Maharajan DK, Tuladhar M. Early enteral feeding in intestinal anastomoses. J Nepal health coune 2011; 9(1):1-5
9. Weimann A et al. ESPEN guideline: Clinical nutrition in surgery. Clinical Nutrition 2017; 36:623-650
10. Ahmad M, Qayyum A, Akhtar M, Shah R, Afridi S, Alam S, et al. Safety ofearly versus delayed enteral feeding following ileostomy closure: Randomized controlled trial. Khyber Med Univ J 2013; 5(4): 195-198.
11. Soni DK, Sharma S, Khan S. Early enteral feeding in patients with gastrointestinal surgery time to send the patient home early. Int surgery journal 2022;9:606-611
12. Kishore K, Nirhale DS, Athavale VS, Goenka GG, Calcuttawala MA. Early Enteral feeding within 24 hours of gastrointestinal surgery versus Nil by mouth: A prospective study. Med J DY Patil Univ 2014;7:173-6
13. Prakash S, Saravanan PS, Hussain A, Prabha C. Safety of early oral feeding after open appendicectomy. IOSR-J Dent Med Sci. 2014;13(9):46-54.
14. Nakeeb AE, Fikry A, Metwally TE, Fouda E, Youssef M, Hosam Ghazy H, Badr S, Khafagy W, Farid M. Early oral feeding in patients undergoing elective colonic anastomoses. International Journal of Surg 2009; 7(3):206-209
15. D. Dorai, J Lalith Kumar, T.Chitra, G. Prasanna. Effects of early enteral nutrition on patients after emergency and elective gastrointestinal surgery. IAIM, 2016;3(8):1-10
16. Stewart BT, Woods RJ, Collopy BT, Fink RJ, Mackay JR, Keck JO. Earlyfeeding after elective open colorectal resections: a prospective randomized trial. Aust N Z J Surg. 1998 Feb;68(2):125-8.

17. Rathin Sarkar, Arunima Ekka Early Vs Delayed Enteral Feeding In CasesOf Duodenal Perforation : An Observational Study. Paripex - Indian journal of research April 2018;volume 7: issue 4
18. Rakshitha D, Pingali SHKR, Amar DN. Comparison of early versus delayed enteral feeding following surgical treatment of gastrointestinal perforations. Int J Res Med Sci 2023;11:2554-60.