Original Research Article

Early versus delayed enteral feeding in acute pancreatitis

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ABSTRACT

Background: Early enteral feeding through a nasoenteric feeding tube is often used in patients with acute pancreatitis, as compared to previous notion of pancreatic rest. This study aims to compare various outcomes of early and late enteral feeding in severe acute pancreatitis.

Methods: This study was a randomized trial conducted at Victoria hospital, Bengaluru between July 2016 and June 2017. Patients with severe acute pancreatitis were randomized into early enteral feeding and late enteral feeding groups in the ratio of 1:1. Early enteral feeding group were started on oral feeds within 24 hours of admission. Late enteral feeding group were started on oral feeds after 72 hours of admission. Patient demographics, clinical findings, investigations, length of hospital stay, complications were assessed and compared.

Results: In 124 out of 132 patients were included who met inclusion criteria. The mean age of patients was 28.6 years. There were 120 males (96.7%) and 4 females (3.2%). There were no significant differences in age, sex ratio and comorbidities between the two groups. Early enteral feeds group showed lesser number of gastrointestinal adverse effects after initiation of enteral feeds, lesser number of days taken to develop full tolerance to enteral feeds, lesser number of days of admission, lesser complications like necrotizing pancreatitis, single or multiple organs failure, lesser number of ICU admissions, requiring mechanical ventilation, including lesser mortality when compared to delayed enteral feeds group.

Conclusions: Patients with severe acute pancreatitis can safely be started on early enteral feeds within 24 hours of admission.

Keywords: Acute pancreatitis, Enteral feeding

INTRODUCTION

Acute pancreatitis is a common gastrointestinal disease leading to hospital admission, and its incidence continues to rise.[1] Acute pancreatitis has a wide spectrum of manifestations, from a mild and self-limiting disease (80%), which usually resolves spontaneously within days, to a rapidly progressive fulminant disease with high morbidity and mortality. Gallstone disease and alcohol abuse are the commonest etiological factors representing more than 80% of the cases.[2-4] Most patients with acute pancreatitis recover without any significant complications and are discharged within a few days of admission to the hospital.[5,6] However in the remaining patients suffer major complications such as infected pancreatic necrosis, which is associated with a high mortality of 15%.[7-9]

Acute pancreatitis is initially managed by keeping the patients nil per oral and the administration of analgesics and ample intravenous fluids.[2,3,10] This is based on the rationale that pancreatic stimulation by enteral feeding

may further aggravate pancreatic inflammation. The validity of this concept of pancreatic rest is controversial and heavily debated.[11-13] Some patients may develop increasing pain on oral intake of food, nausea and vomiting due to ileus. Oral feeding may be resumed once the abdominal pain reduces, absence of nausea and vomiting, and return of appetite. Parenteral nutritional support is required for patients intolerant to oral feeds within several days.[1,4,8,9]

The exact pathophysiological mechanisms of bacterial infection in acute pancreatitis have not been elucidated. But it seems unequivocal that delaying enteral feeding increases the risk for pancreatic necrosis and the development of multi organ failure during severe acute pancreatitis by increasing bacterial translocation and pathogen overgrowth, which can be detected in the very early phase of acute pancreatitis. In a multicenter study, Besselink et al demonstrated that bacteraemia can be detected as early as day 7 and that infected necrosis can be detected on average 26 days after hospital admission. Early bacterial invasion may further worsen SIRS, making the patient even more susceptible to multi-organ failure, initiating a vicious cycle.[14] Early enteral feeding may reduce or prevent bacterial translocation by maintaining the intestinal barrier. Hence, it is reasonable to start enteral feeding as early as possible.

This study has hence been taken up to compare and determine the various outcomes of early and late enteral feeding in severe acute pancreatitis and determine whether patients can safely be started orally without aggravating the symptoms or complications.

METHODS

This study was a randomized control trial conducted at Victoria hospital, Bengaluru. The patients admitted with severe acute pancreatitis between July 2016 and June 2017, were included in the study.

Pancreatitis was diagnosed if at least two of the three following features were present: typical history of abdominal pain, a serum lipase or amylase level that was more than 3 times the upper limit of the normal range, or characteristic findings on cross-sectional imaging of the abdomen. Patients with mild acute pancreatitis and chronic pancreatitis were excluded from the study.

The patients included in the study were randomized into two groups i.e., early enteral feeding and late enteral feeding in the ratio of 1:1. The patients in early enteral feeding group were started on oral feeds within 24 hours of admission. The late enteral feeding group were started on oral feeds after 72 hours of admission. The following parameters were assessed and compared; patient demographics, duration from onset of symptoms, clinical findings, investigations, length of hospital stay, complications. The data from both groups were compared.

Demographics and clinical characteristics were expressed as means for continuous variables or proportions for categorical variables. The risk ratio was calculated within 95% confidence interval. The p value of less than 0.05 was considered statistically significant.

RESULTS

A total of 132 patients were admitted and diagnosed to have acute pancreatitis from July 2016 to June 2017. Out of these 8 patients were excluded. In 124 patients were included who met inclusion criteria. The mean age of patients was 28.6 years. There were 120 males (67.9%) and 4 females (32.1%). Randomization was performed using simple random tables. Patients were divided into two groups, 'early feeds' and 'delayed feeds' in the ratio 1:1 based on time of initiation of enteral feeds. Comparison of demographics characteristics between two groups are shown in Table 1.

Table 1: Demographic and clinical data.

	Total	Early feeds	Delayed feeds
Total no. of cases	124	62	62
Age	28.6	27.4	29.8
Male	120(96.7%)	59(95.1%)	61(98.3%)
Female	4(3.2%)	3(4.8%)	1(1.6%)
Co-morbidities	6(4.8%)	3(4.8%)	3(4.8%)
Etiology			
Alcohol	104(83.8%)	50(80.6%)	54(87.1%)
Gall stones	18(14.5%)	10(16.1%)	8(12.9%)
Idiopathic	2(1.6%)	2(3.2%)	0
Disease severity			
APACHE-II	11.5	11.2	11.9
No. of days of hospital stay	8.1	7.2	8.9
Respiratory failure	6(4.8%)	2(3.2%)	4(6.4%)
Multi-organ failure	6(4.8%)	2(3.2%)	4(6.4%)

There were no significant differences in age, sex ratio and comorbidities between the two groups. Comparison of tolerance to enteral feeds and gastrointestinal events after starting enteral feeds are shown in Table 2.

Early enteral feeds group showed lesser number of gastrointestinal adverse effects after initiation of enteral feeds when compared to delayed enteral feeds group. Comparisons of final outcomes of the disease are shown in Table 3.

The early enteral feeds group again showed lesser number of days taken to develop full tolerance to enteral feeds and number of days of admission. Early feeds group also demonstrated lesser complications like necrotizing pancreatitis, single or multiple organs failure,

lesser number of ICU admissions, requiring mechanical

ventilation, including lesser mortality.

Table 2: Comparison of tolerance of enteral feeds and gastrointestinal events.

	Early feeds	Delayed feeds	Risk ratio	P value
Full tolerance to diet	4.8	7.2		
Nausea	34	37	0.91(0.67-1.24)	0.58
Vomiting	12	16	0.75(0.38-1.45)	0.39
Ileus	8	9	0.88(0.36-2.15)	0.79
Diarrhoea	4	7	0.57(0.17-1.85)	0.35
Aspiration	1	1	1(0.06-15.63)	
Need for parenteral nutrition	4	6	0.66(0.19-2.24)	0.51

Table 3: Comparison of final outcomes.

	Early feeds	Delayed feeds	Risk ratio	P value
Necrotizing pancreatitis	29	31	0.93(0.65-1.34)	0.71
Infected necrosis	0	0	-	-
ICU admissions	2	4	0.5(0.09-2.63)	0.41
Mechanical ventilation	2	4	0.5(0.09-2.63)	0.41
Single organ failure	28	31	0.9(0.62-1.3)	0.59
Multi-organ failure	2	4	0.5(0.09-2.63)	0.41
Death	2	4	0.5(0.09-2.63)	0.41

DISCUSSION

Early enteral feeding is recommended in most current ICU guidelines.[15,16] However, the methodologic quality of the trials that form the basis for these general ICU recommendations has been criticized.[17] Thus, for critically ill patients in general and for those with acute pancreatitis specifically, large, high-quality, randomized, controlled trials that show an improved outcome with early enteral feeding are lacking.[18] The trophic effect of early enteral feeding would stabilize the integrity of the gut mucosa, reducing inflammation and improving the outcome.

In present study, the demographic and clinical parameters were similar in both groups. The early feeds group had lesser mean duration of hospital stay (7.2 days) as compared to late enteral feeds (8.9 days). Early feeds group also showed lesser number of gastrointestinal complications and better tolerance to oral diet when compared with late feeds group. Early enteral feeds group also demonstrated lesser mortality (2 deaths) as compared to late feeds (4 deaths). A systematic meta-analysis published by Petrov et al involving 11 randomized controlled trials demonstrated that the risk of multi-organ failure, pancreatic infectious complications and mortality were significantly reduced in patients with acute pancreatitis who were enterally fed within the first 48 hours of admission as opposed to parenteral feeding.[19] Importantly, the differences were not statistically significant, if enteral nutrition was commenced 48 hours after admission. In fact, a large amount of evidence-based data supports the administration of enteral nutrition within 24 hours of hospital admission.[20]

This has been further confirmed by Sun et al in a recently published randomized controlled trial.[21] The authors investigated the effects of early administration of enteral nutrition on the immune function and clinical outcomes of 60 patients with severe acute pancreatitis. The incidences of multiple organ dysfunction syndrome, SIRS and pancreatic infection, as well as the duration of stay in the intensive care unit, were significantly lower in the early administration group (commenced within 48 hours of hospital admission) than in patients whose enteral feeding began on the eighth day of hospital stay. However, the authors did not report a difference in mortality between the two groups.

CONCLUSION

Patients with severe acute pancreatitis can safely be started on early enteral feeds within 24 hours of onset of symptoms. Early feeding also reduces complications, allows early tolerance to oral diet and early discharge of patients. It also reduces the need for parenteral nutrition, thus reducing the economic burden on patients.

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