Original Research Article

Role of early enteral feeding in mild and moderate acute pancreatitis

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ABSTRACT

Background: Timing of enteral feeding in acute pancreatitis was always a matter of controversy. Increasing evidence suggests that early enteral feeding reduces systemic and local complications of pancreatitis and thereby hospital stay. Hence the study has been undertaken to determine the feasibility, advantages and disadvantages of early enteral feeding in mild and moderate acute pancreatitis.

Methods: Patients admitted with symptoms and signs suggestive of mild and moderate acute pancreatitis who were started on early enteral feeding (within 48 hours of admission) were included in study. Blood investigation results are used to classify patients accordingly to mild and moderate acute pancreatitis based on Ransons's score. Patients were followed up and categorized based on development of complications, length of hospital stay.

Results: Majority of the patients who were started on early enteral feeding showed significant decrease in complications and hospital stay. Study also suggested that age is a significant risk in development of complications. Gender is not significant in the development of complications.

Conclusions: There is significant decrease in rate of systemic complication, local infective and non-infective complications, length of hospital stay among acute pancreatitis patients who were started on early enteral feeding (within 48 hours).

Keywords: Acute pancreatitis, Early enteral feeding, Delayed enteral feeding, Total parenteral nutrition

INTRODUCTION

Acute pancreatitis is a potentially lethal disease with wide variation in severity ranging from mild and self-limiting to a rapidly progressive illness leading to multiorgan failure.[1] Damage of intestinal barrier function accelerates the development of local and systemic infectious complications. In the early stage of acute pancreatitis, the intestinal permeability has been significantly increased, which results in the translocation of inflammatory mediators and toxic products.[2] Furthermore, the gut microorganisms get the chance to the systemic circulation through the damaged intestinal epithelial cells. As a consequence, the sepsis or infected pancreatic necrosis occurs in the early stage of acute pancreatitis.[3] So, the maintenance of intestinal barrier function in the early stage is critical for the mortality and prognosis.

In acute pancreatitis, the inflammatory response induced by necrosis or secondary infection leads to the increase of caloric requirement and loss of mass protein. This contributes to the nutritional deterioration and negative nitrogen balance, which further lead to the damage of function and structure of vital organs.[4] Parenteral nutrition (PN) has been regarded as the standard care for providing nutrients and can avoid pancreatic stimulation. But, PN may lead to intestinal atrophy and attenuate the intestinal barrier function.[5]

Enteral nutrition (EN) is found to be better at maintaining the function and structure of intestinal mucosa thereby decreasing the local complications and systemic complications like shock, pulmonary insufficiency, renal failure, gastrointestinal bleeding, DIC and length of hospital stay in acute pancreatitis. Local complications

are further divided into non infective ones like sterile peripancreatic fluid collection, pancreatic necrosis, pseudocyst, ascites and fistula and infected ones like infected fluid collection, necrosis and cyst. Furthermore, enteral nutrition eliminates some of the complications of parenteral nutrition such as catheter related sepsis, thrombosis, thrombophlebitis, catheter related embolism and pneumothorax and stress-induced hyperglycemia.[7] 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.[8] The differences were not statistically significant, if enteral nutrition was commenced 48 h after admission.[9] Similarly previous studies showed that early enteral nutrition was associated with a lesser number of days admitted in hospital.[10] Very few studies have been undertaken in this field. Conventional teaching of keeping patients' nil per orally in acute pancreatitis is still being followed in many parts of the world.

With this study we aim to assess the occurrence of infective and non-infective complications and length of hospital stay in patients who were admitted with mild and moderate acute pancreatitis who were started on early enteral feeding (within 48 hours of admission).

METHODS

The study was conducted in 80 patients admitted in government medical college Thrissur, department of general surgery, Thrissur, Kerala, India with symptoms and signs suggestive of mild and moderate acute pancreatitis and started on early enteral feeding (within 48 hours of admission) for 1 year following ethical clearance, in the adult age group (>17 and less than 70). It was a prospective study conducted during 2018-2019. Patients who had signs of shock at time of presentation, drug induced pancreatitis, post ERCP pancreatitis were excluded from the study. Details of the study protocol are explained to the subjects. Written informed consent is obtained. All of the clinical and laboratory data are collected and recorded prospectively at specific time intervals.

The variables for evaluation are: 1) On admission: Random blood sugar (RBS), total leucocyte count (TLC), serum lactate, dehydrogenase (LDH), serum aspartate transaminase (AST), haemoglobin and packed cell volume (PCV), blood urea nitrogen (BUN), serum creatinine, arterial blood gas analysis (ABG). 2) After 48 hours of admission: Serum calcium, repeat PCV, BUN, ABG. 3) Imaging modalities: Chest x-ray, ultrasound abdomen and X-ray erect abdomen

Blood investigations are done at the time of admission and 48 hours later. Results are used to calculate Ranson's score and classify patients accordingly to mild, moderate pancreatitis. Patients are started on early enteral feeding (within 48hours of admission) followed up and

categorized based on development of complications (both local infective and non-infective and systemic) length of hospital stay and results are entered in pro forma. Results are used for statistical analysis.

Sample size was calculated by using values of similar studies.

Sample size calculation

Alpha error at 95% confidence interval (ZX)=1.96

Formula, $N=(ZX)\times(ZX)\times p \times q/d \times d$

p-prevalence (percentage of study population developing complication in mild and moderate acute pancreatitis based on previous studies).[11-17]

q-(100-p)

d-Absolute precision-20% of (p), minimum required sample size-78 and no. of samples taken in the study-80.

Data was coded and entered in MS excel. Quantitative variables were expressed in terms of mean and standard deviation. Qualitative variables were expressed as proportion. Association between quantitative variables were analysed using correlation, regression, multiple regression. Association between qualitative variables were analysed using chi square or fisher exact test. Data was presented as mean±SD. P<0.05 is considered statistically significant. Analysis was done using statistical software SPSS.

RESULTS

A total of 80 patients who were admitted with mild and moderate acute pancreatitis in govt. medical college Thrissur, participated in the study during the period of one year. Mean age of the study group (n=80) is 42.825

Sex distribution

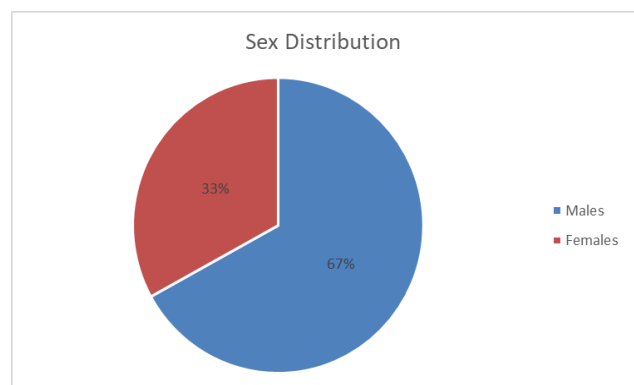The study consisted of 67% males and 33% females.

Figure 1: Sex distribution chart.

Table 1: Case distribution.

Type of pancreatitis	Number (%)
Mild	57 (71)
Moderate	23 (29)

Systemic complications

Out of 80 patients only 5 patients developed systemic complications.
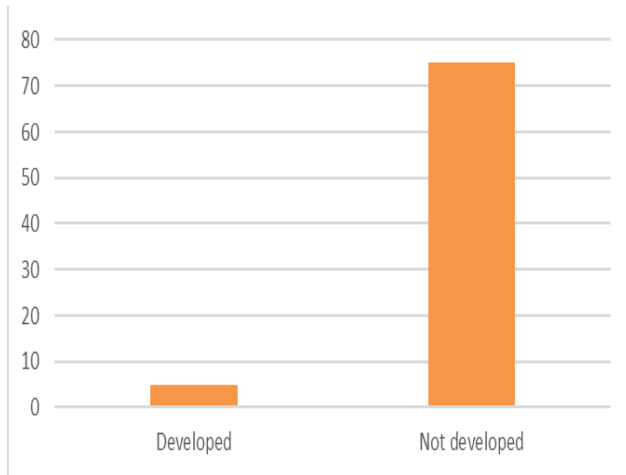

Figure 2: Systemic complications.

Local infective complications

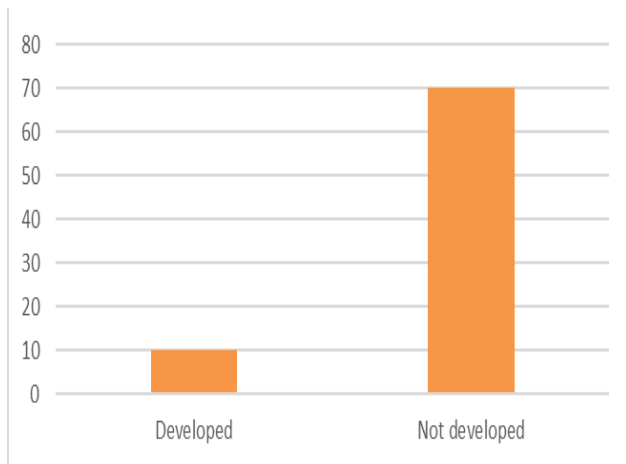Out of 80 patients 10 developed local infective complications.

Figure 3: Local infective complications.

Local non-infective complications

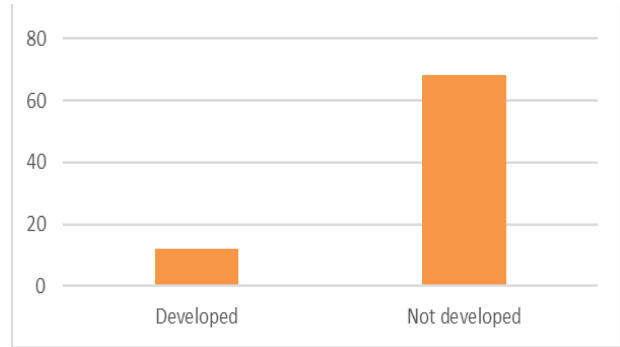The 12 patients developed local non infective complications. Average duration of hospital stay is 4.425 days.

Figure 4: Local non-infective complications.

Age and development of complication

Table 2: Age and development of complication.

Variables	≤45 years (%)	>45 years (%)	Total (%)
Complication	6 (26)	17 (74)	23 (100)
No complication	52 (91)	5 (9)	57 (100)
Total	58	22	80

Relationship between sex and complications

Table 3: Relationship between sex and complications.

Gender	Complication (%)	No complication (%)	Total (%)
Male	17 (31)	37 (69)	54 (100)
Female	6 (23)	20 (77)	26 (100)
Total	23	57	80

DISCUSSION

A total number of 80 patients who satisfied inclusion criteria and who gave consent, were included in this study. Out of the 80 patients, the total number of males who were admitted with mild and moderate acute pancreatitis was 54 and the total number of females was 26. Out of 80 patients admitted, the mean age of the study group was 42.825 years. The 57 (71%) patients developed mild acute pancreatitis and 23 (29%) patients developed moderate acute pancreatitis in the study group.

In the study group, 5 (6%) patients developed systemic complications out of 80 patients. Ten (12%) patients developed local infective complications. The 12 (15%) patients developed local non infective complications out of 80 patients. One death occurred among 80 patients. Average duration of hospital stay was 4.425±SD (2.004) days. In the previous studies conducted by Petrov et al, Sun et al, Eckerwall et al, Li et al and few others chances of systemic complication, local infective and non-infective complication is 37%, 25%, 36 % respectively for patients started on delayed enteral feeding in acute

pancreatitis.[8,18-20] Statistical analysis shows that there is significant difference among patients started on early and delayed enteral feeding. Similarly, the average duration of hospital stay was 11.9±2.6 days in previous studies, which also shows a significant difference.[18]

In the above study out of 80 patients, 23 patients developed complications after starting early enteral feeding. Among them 6 (26%) patients were below 45 years of age, and 17 (74%) patients were above 45 years of age which is statistically significant (p<0.05). This shows that the chance of complication following acute pancreatitis increases with age.

Out of 54 males 17 (31%) developed complications and out of 26 females 6 (23%) patients developed complications. Statistical analysis showed that chi-square 0.6052, (p=0.436609). There is no significant difference in development of complication and sex.

Out of the patients who developed complications 4 (17%) patients were discharged before 4 days (average 4 days), while 19 (83%) patients had to be admitted for more than 4 days in hospital, which is statistically significant (chi-square-6.26, p=0.012).

CONCLUSION

To conclude, in my study of 80 patients with mild and moderate acute pancreatitis who were started on early enteral feeding (within 48 hours) conducted over a period of 1 year, there is significant decrease in rate of systemic complication, local infective and non-infective complications and length of hospital stay. The study also revealed that age is a significant factor for development of complications that as age increases complications also increases. Also, there is no significant difference in development of complications among males and females. Further studies are required in this field to understand the effect of early enteral feeding in severe acute pancreatitis, type of enteral nutrition and its effect on recovery from acute pancreatitis etc, thereby significantly reducing the complications and hospital stay in future.

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