



A Prospective Study Between Early and Late Oral Feeding in Patients with Acute Pancreatitis.

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Abstract

Background: Nutritional management plays a pivotal role in the treatment of acute pancreatitis. Traditionally, patients were kept nil per oral to provide “pancreatic rest”; however, recent evidence suggests that early oral feeding (EOF) may improve clinical outcomes without worsening pancreatic inflammation. This study compared the outcomes of early and late oral feeding (LOF) in patients with acute pancreatitis. **Methods:** The study was conducted at a tertiary care teaching hospital over a period of 18 months. The prospective comparative study was conducted among 100 patients diagnosed with acute pancreatitis. Patients were categorized into EOF (n=47) and LOF (n=53) groups. Demographic characteristics, disease severity, biochemical parameters, feeding tolerance, complications, intensive care unit (ICU) admission, length of hospital stay, and mortality were assessed and compared between the two groups. **Results:** Mild acute pancreatitis was observed in 57% of patients, while 43% had moderately severe disease. Oral intake was tolerated by 76% of patients, and only 17% required nasogastric feeding. The early feeding group had significantly lower serum amylase, lipase, and LDH levels compared with the late feeding group ($p < 0.05$). Local (12.8% vs. 28.3%) and systemic complications (10.6% vs. 22.6%) were less frequent with early feeding, although the differences were not statistically significant. ICU admission (14.9% vs. 15.1%; $p = 0.978$) and mortality (2.1% vs. 3.8%; $p = 0.630$) were comparable between groups. Early oral feeding was associated with a significantly shorter hospital stay than late feeding (4.92 ± 1.74 vs. 7.62 ± 2.31 days; $p < 0.001$). **Conclusion:** Early oral feeding is safe, feasible, and associated with significantly reduced hospital stay and favorable clinical outcomes without increasing mortality or ICU requirements. Early initiation of oral nutrition should be encouraged in appropriately selected patients with mild to moderately severe acute pancreatitis.

Keywords: Acute Pancreatitis; Early Oral Feeding, Late Oral Feeding, Nutritional Management.



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INTRODUCTION

Acute pancreatitis is a severe inflammatory condition of the pancreas that often shows with abdominal pain also systemic disturbances, and its management has progressed considerably over the past decades with a growing focus on supportive care strategies. Among the various aspects of treatment, nutritional management has been one of the most debated and extensively researched areas. Traditionally, individuals with acute pancreatitis were kept nil per oral (NPO) for extended periods to provide so-called “pancreatic rest,” through the belief that oral feeding could stimulate pancreatic exocrine secretion and exacerbate the inflammatory process. This practice of delayed feeding, however, has been increasingly challenged by evidence suggesting that early initiation of oral or enteral nutrition may offer significant clinical benefits. The comparison between early and late oral feeding in acute pancreatitis has therefore become a central subject in the optimization of therapeutic strategies for this disease. [1,2]

Several studies have demonstrated that early oral feeding, usually within 24–48 hours of admission, is safe and feasible in mild to moderately severe acute pancreatitis. It is associated with shorter hospital stay, fewer complications, faster recovery, and reduced healthcare costs without increasing pain recurrence or disease exacerbation. In contrast, delayed feeding is linked to prolonged hospitalization, malnutrition, and gut dysfunction. [3,4]

In cases of severe pancreatitis, the timing and mode of feeding require more cautious consideration. Severe pancreatitis is often complicated by ileus, necrosis, or systemic complications, which may limit oral tolerance. In such patients, enteral nourishing via nasojejunal or nasogastric tubes has been shown to be superior to parenteral nutrition. Enteral feeding decreases contagious difficulties, lowers mortality rates, and minimizes metabolic derangements compared with parenteral nutrition. Early enteral nutrition in severe pancreatitis has been associated with better results by reducing bacterial translocation and modulating the inflammatory cascade. Late feeding or prolonged fasting, in contrast, exacerbates catabolism, delays recovery, and predisposes to complications. Therefore, while the concept of early oral feeding is more readily applicable to mild and moderate cases, the principle of early enteral feeding also extends to severe disease, albeit through alternate routes when oral intake is not feasible. [4,5]

It is significant, however, to recognize that not all individuals are candidates for immediate oral feeding. Persistent nausea, vomiting, abdominal distension, or ileus may necessitate temporary delay or alternative routes of nutrition. The timing of feeding should therefore be individualized, guided by clinical assessment and tolerance rather than rigid timelines. Early oral feeding must be attempted as soon as the patient is able to endure it without exacerbating symptoms. This balanced approach ensures safety while still capitalizing on the benefits of avoiding prolonged fasting.[6,7]

The aim of this study was to assess a prospective study among early also late oral feeding in individuals with acute pancreatitis.

MATERIALS AND METHODS

The prospective, comparative, observational study was conducted at the Department of General Surgery, Dr. D.Y. Patil Medical College, Hospital and Research Institute, Kolhapur, over a period of 18 months. Ethical clearance was obtained from the Institutional Ethics Committee before starting the study. A consecutive sampling technique was employed and a total of 100 patients were selected for the study.

Inclusion Criteria

Adult patients aged ≥ 18 years diagnosed with acute pancreatitis based on characteristic clinical features, elevated serum amylase or lipase levels (>3 times the upper limit of normal), and/or radiological findings were included in the study. Eligible participants were classified as having mild to moderate acute pancreatitis according to the Revised Atlanta Classification, had no contraindications to oral feeding, and were willing and able to provide informed written consent.

Exclusion Criteria

Patients with a history of chronic pancreatitis, inflammatory bowel disease, or gastrointestinal obstruction; were pregnant or lactating; or were immunocompromised due to conditions such as HIV/AIDS, active chemotherapy, or long-term immunosuppressive therapy. Exclusion criteria also included significant comorbidities likely to affect study outcomes, such as advanced liver disease (Child-Pugh class C) or stage 4–5 chronic kidney disease, as well as inability to tolerate oral feeding at admission due to persistent vomiting, ileus, or other physician-determined contraindications to oral intake.

Upon admission, all individuals with suspected severe pancreatitis were managed rendering to the hospital's standard protocol, which included intravenous fluid resuscitation, analgesia, also nil per os (NPO) status initially. After confirmation of the diagnosis and assessment of severity, eligible patients were approached for consent. Once enrolled, detailed history and clinical examination were performed. All patients underwent routine investigations, containing whole blood count, renal and liver function tests, serum electrolytes, also specifically, serum amylase, lipase, and LDH levels. An ultrasound of the abdomen and pelvis was achieved for all patients.

The members were considered into two study groups based on the actual time of initiation of oral feeding:

Group A (Early Oral Feeding Group): This group comprised patients who commenced oral feeding in the first 24 hours of hospital admission. The nourishing was initiated with a clear liquid diet also progressive to a soft solid diet as endured, following a standardized protocol.

Group B (Late Oral Feeding Group): This group comprised patients in whom oral feeding was intentionally delayed and initiated after the first 24 hours of hospital admission. The decision for delay was complete by the treating team based on clinical assessment, also feeding was similarly advanced as per the same standardized protocol once initiated.

The timing of the initiation of oral feeding was noted, and patients were assigned to their respective groups accordingly. Their progress was monitored daily, recording vital signs, pain scores, feeding tolerance, and any adverse events until discharge.

Data was collected using a pre-designed structured proforma and entered into Microsoft Excel and statistically analyzed using the SPSS 26.0 version. Descriptive statistics were presented as mean $\pm$ standard deviation for continuous variables and as numbers also percentages for categorical variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Characteristics of Study Participants

Variable	Value
Age (years)	
Mean $\pm$ SD	50.27 $\pm$ 19.08
Range	19–79
Gender	
Male	69 (69.0%)
Female	31 (31.0%)

The age of individuals with severe pancreatitis ranged from 19 to 79 years, with a mean age of 50.27 years also a standard deviation of 19.08 years. Out of 100 study participants, 69 were males and 31 were females.

Table 2: Distribution of patients according to feeding group

Feeding Group	Frequency	Percentage
Early	47	47.00%
Late	53	53.00%
Total	100	100%

Among 100 patients, 47 individuals were included in the early nourishing group and 53 individuals were included in the late feeding group. Thus, 47.00% of the study population received early oral feeding, while 53.00% received late oral feeding. The distribution shows a nearly balanced allocation among the two feeding groups.

Table 3: Severity classification of acute pancreatitis among study participants

Severity	Frequency	Percentage
Mild	57	57.00%
Moderate	43	43.00%
Total	100	100%

Of the 100 study participants, 57 patients had mild acute pancreatitis and 43 individuals had moderate severe pancreatitis. Mild cases accounted for 57.00% of the study population, whereas moderate cases constituted 43.00%. The findings indicate that mild acute pancreatitis was more common than moderate acute pancreatitis in the present study.

Table 4: Distribution of SIRS on admission among patients

'SIRS on Admission	Frequency	Percentage
No	59	59.00%
Yes	41	41.00%
Total	100	100.00%

SIRS on admission was absent in 59 patients and present in 41 patients. Therefore, 59.00% of the study participants did not have SIRS at admission, while 41.00% had SIRS. These findings show that the majority of patients were admitted without systemic inflammatory reaction syndrome.

Table 5: Ultrasonography (USG) findings in patients with acute pancreatitis

USG Findings	Frequency	Percentage
Edematous pancreas	67	67.00%
Normal	20	20.00%
Peripancreatic collection	13	13.00%
Total	100	100.00%

Ultrasonography presented edematous pancreas in 67 individuals, normal findings in 20 patients, and peripancreatic collection in 13 patients. Thus, edematous pancreas was the most mutual USG finding, accounting for 67.00% of cases, followed by normal findings in 20.00% and peripancreatic collection in 13.00% of patients.

Table 6: Oral intake tolerance among study participants

Oral Intake Tolerance	Frequency	Percentage
No	24	24.00%
Yes	76	76.00%
Total	100	100.00%

Oral intake was tolerated by 76 patients, while 24 patients did not tolerate oral intake. Hence, 76.00% of the study participants showed tolerance to oral feeding, whereas 24.00% did not tolerate it. The findings indicate that most individuals were able to tolerate oral intake during the course of management.

Table 7: Comparison of biochemical parameters between early and late oral feeding groups

	Feeding Group	Mean	Std. Deviation	p-value
Serum Amylase	Early	614	209	0.026*
	Late	723	270	
Serum Lipase	Early	835	271	0.006*
	Late	1009	340	
LDH	Early	345.7	91.4	0.006*
	Late	401	104	

Mean serum amylase, serum lipase, and LDH were lower in the early feeding group than in the late feeding group. Serum amylase was 614 versus 723 ($p=0.026$), serum lipase was 835 versus 1009 ($p=0.006$), and LDH was 345.7 versus 401 ($p=0.006$), showing significant biochemical differences between groups

Table 8: Association between Mortality and Feeding Group

Mortality	Feeding Group		Total	p-value
	Early	Late		
No	46	51	97	0.630
	97.90%	96.20%	97.00%	
Yes	1	2	3	
	2.10%	3.80%	3.00%	
Total	47	53	100	
	100.00%	100.00%	100.00%	

Mortality was absent in 46 patients (97.90%) in the early feeding group and 51 individuals (96.20%) in the late feeding group. Mortality occurred in 1 patient (2.10%) in the early group and 2 individuals (3.80%) in the late group. The association was not statistically significant ($p=0.630$).

Table 9: Association between ICU Admission and Feeding Group

ICU Admission	Feeding Group		Total	p-value
	Early	Late		
No	40	45	85	0.978
	85.10%	84.90%	85.00%	
Yes	7	8	15	
	14.90%	15.10%	15.00%	
Total	47	53	100	
	100.00%	100.00%	100.00%	

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ICU admission was not essential in 40 patients (85.10%) in the early feeding group and 45 individuals (84.90%) in the late feeding group. ICU admission was essential in 7 patients (14.90%) in the early group and 8 individuals (15.10%) in the late group. The association was not statistically significant ($p=0.978$).

Table 10: Association between Local Complications and Feeding Group

Local Complications	Feeding Group		Total	p-value
	Early	Late		
No	41	38	79	0.057
	87.20%	71.70%	79.00%	
Yes	6	15	21	
	12.80%	28.30%	21.00%	
Total	47	53	100	
	100.00%	100.00%	100.00%	

Local complications were absent in 41 patients (87.20%) in the early feeding group also 38 patients (71.70%) in the late nourishing group. Local complications were present in 6 patients (12.80%) in the early group also 15 individuals (28.30%) in the late group. The association approached statistical significance ($p=0.057$).

Table 11: Association between Systemic Complications and Feeding Group

Systemic Complications	Feeding Group		Total	p-value
	Early	Late		
No	42	41	83	0.111
	89.40%	77.40%	83.00%	
Yes	5	12	17	
	10.60%	22.60%	17.00%	
Total	47	53	100	
	100.00%	100.00%	100.00%	

Systemic complications were not observed in 42 patients (89.40%) in the early nourishing group and 41 patients (77.40%) in the late feeding group. Systemic complications occurred in 5 individuals (10.60%) in the early group also 12 individuals (22.60%) in the late group. The association was not statistically significant ($p=0.111$).

Table 12: Comparison of length of hospital stay between early and late oral feeding groups

	Feeding Group	Mean	Std. Deviation	p-value
Length of Stay (Days)	Early	4.92	1.74	<0.001*
	Late	7.62	2.31	

*Indicates Significance ($p\text{-value}<0.05$)

The mean length of hospital stay was 4.92 ± 1.74 days in the early feeding group and 7.62 ± 2.31 days in the late nourishing group. The difference was statistically significant ($p<0.001$), indicating a shorter duration of hospitalization in individuals who received early oral feeding.

Table 13: Distribution of CT Findings among patients

CT Findings	Frequency	Percentage
Acute pancreatitis with peripancreatic fluid collection	8	8.00%
Interstitial edematous pancreatitis	52	52.00%
Necrotizing pancreatitis with peripancreatic collection	21	21.00%
No significant abnormality / mild pancreatic edema	19	19.00%
Total	100	100.00%

CT findings showed interstitial edematous pancreatitis in 52 patients (52.00%), necrotizing pancreatitis with peripancreatic collection in 21 patients (21.00%), no significant abnormality or mild pancreatic edema in 19 patients (19.00%), and acute pancreatitis with peripancreatic fluid collection in 8 patients (8.00%). Interstitial edematous pancreatitis was the most mutual CT finding.

DISCUSSION

The present study was conducted to prospectively compare early and late oral feeding in severe pancreatitis and evaluate their effect on important clinical outcomes during hospitalization, including feed tolerance, ICU admission, complications, length of hospital stay, and in-hospital mortality.

The present study included predominantly middle-aged and older adults with a mean age of 50.27 ± 19.08 years and a male predominance (69%). These findings are consistent with the demographic characteristics reported by Eckerwall et al. [8], who observed comparable age and sex distributions between study groups. Similar feeding studies by Jacobson et al. [9], Sathiaraj et al. [10], and de-Madaria et al. [11] primarily involved adult populations, supporting the generalizability of the present cohort.

Patients were nearly equally distributed between the early (47%) and late (53%) feeding groups, providing a balanced comparison. This allocation is comparable to previous randomized studies evaluating different oral feeding strategies in acute pancreatitis conducted by Eckerwall et al. [8], Sathiaraj et al. [10], Moraes et al. [12], and Bakker et al. [13].

Most patients had mild (57%) or moderate (43%) acute pancreatitis, reflecting a predominantly non-severe disease population. Similar patient profiles were evaluated by Sathiaraj et al. [10], and Moraes et al. [12]. SIRS was present in 41% of patients at admission, indicating a substantial inflammatory burden. Despite this, early feeding remained feasible, consistent with findings from Eckerwall et al. [8], who reported no worsening of systemic inflammatory response with early oral feeding.

Edematous pancreas was the most common ultrasonographic finding (67%), suggesting predominance of interstitial edematous pancreatitis. Oral feeding was tolerated by 76% of patients, supporting the feasibility of early refeeding. These findings are in agreement with Eckerwall et al. [8], Jacobson et al. [9], and Moraes et al. [12], who demonstrated good tolerance and safety of early oral feeding strategies.

Patients in the early feeding group had significantly lower serum amylase, lipase, and LDH levels compared with the late feeding group ($p < 0.05$). Although Eckerwall et al. [8] reported no significant biochemical deterioration with early feeding, the present findings suggest a more favorable biochemical profile and support the safety of avoiding prolonged fasting.

Mortality was low in both groups (2.1% vs. 3.8%) and did not differ significantly ($p = 0.630$). Similarly, ICU admission rates were nearly identical between groups (14.9% vs. 15.1%; $p = 0.978$). These findings are consistent with Bakker et al. [13], who found no increase in adverse outcomes with early nutritional intervention.

Although not statistically significant, local complications were less frequent in the early feeding group than in the late feeding group (12.8% vs. 28.3%; $p = 0.057$). Systemic complications also occurred less frequently in the early feeding group (10.6% vs. 22.6%; $p = 0.111$). Similar reductions in complications with enteral nutrition have been reported by Petrov et al. [14] and Wu et al. [15], supporting the potential protective effect of early nutritional support.

A significant reduction in hospital stay was observed in the early feeding group compared with the late feeding group (4.92 ± 1.74 vs. 7.62 ± 2.31 days; $p < 0.001$). This finding is consistent with reports by Eckerwall et al. [8], and Wu et al. [15], all of whom demonstrated shorter hospitalization with earlier feeding strategies.

CT imaging revealed interstitial edematous pancreatitis in 52% of patients, followed by necrotizing pancreatitis with peripancreatic collection in 21%. These findings indicate a predominantly non-severe to moderately severe disease spectrum, comparable to the populations studied by Eckerwall Jacobson et al. [9], Sathiaraj et al. [10], and Moraes et al. [12]. The predominance of less severe radiological findings likely contributed to the high oral feeding tolerance, low ICU requirement, and low mortality observed in the present study.

The present study is strengthened by its prospective design, balanced comparison of early and late oral feeding groups, inclusion of both mild and moderate acute pancreatitis cases, and comprehensive assessment of clinical, biochemical, and radiological outcomes. Evaluation of multiple endpoints, including feeding tolerance, complications, ICU admission, mortality, and length of hospital stay, enhances the clinical relevance of the findings. The significant reduction in hospital stay observed with early oral feeding further supports its practical utility and safety. However, the study is limited by its relatively modest sample size, single-center setting, predominance of non-severe pancreatitis cases, and focus on short-term in-hospital outcomes. Additionally, the lack of detailed etiological stratification, long-term follow-up, standardized feeding protocol description, and patient-reported outcome measures may limit generalizability. Therefore, larger multicenter studies with extended follow-up are warranted to validate and expand upon these findings.

CONCLUSION

The present prospective study on early versus late oral nourishing in individuals with severe pancreatitis clearly demonstrates that early oral feeding is a safe, feasible, and clinically beneficial strategy in patients with predominantly mild to modest disease.

The strongest evidence in favor of early feeding was the highly significant reduction in hospital stay. Patients in the early feeding group had a mean hospital stay of 4.92 ± 1.74 days, whereas those in the late feeding group stayed for 7.62 ± 2.31 days, with a p-value <0.001 . This reduction of nearly 2.70 days is of major clinical importance because it reflects earlier recovery, reduced hospital burden, improved bed utilization, lower healthcare costs, and better patient comfort. Taken together, the results of the current study support the conclusion that early oral nourishing in acute pancreatitis is not only feasible and well tolerated in the majority of individuals, but also associated with significant decrease in hospital stay and favourable trends in complication rates without increasing mortality or ICU requirement. Therefore, early oral feeding should be considered a safe also effective management strategy in selected individuals with mild to modest severe pancreatitis, also unnecessary delay in initiation of oral nutrition must be avoided in routine clinical practice.

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