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Acute Pancreatitis: Onset of Oral Tolerance as An Indicator of Recovery

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1. Abstract

Overall, early initiation and good tolerance in patients with pancreatitis are correlated with shorter hospital stays compared to late initiation or intolerance.

1.1. Objective

To determine whether the onset of oral refeeding can be used as an indicator of recovery in acute pancreatitis and to describe its relationship with early refeeding and length of hospital stay.

1.2. Material and Methods

A prospective, longitudinal, and analytical observational study was conducted, including 101 patients with acute pancreatitis. The analysis used Prevalence Ratio (PR) with 95% CI; $p<0.05$.

1.3. Results and Discussion

Males predominated (68,8%); 75,2% were between 20 and 59 years old. Early initiation was observed in 60.4%, tolerance in 88.1%, and a hospital stay of 0 to 9 days in 69,3%. Early onset was inversely correlated with length of stay (p=0.001): 0–4 days vs. 5–9 days, PR=0.70 (95% CI 0,51–0.94), 10–14 days PR=0,39 (0,18–0,81), and 15–19 days PR=0,15 (0.02–0.92). Tolerance showed a favourable trend (62,9% vs. 41,7%; PR=1.51, 95% CI 0.75–3,00; p=0.157). No correlation was found between sex (p=0.102), age (p=0.718), exacerbation (p=0.682), or severity (p=0,182). By etiology, metabolic pancreatitis showed a higher probability of early initiation compared to biliary pancreatitis (PR=1,57; 95% CI 1.11–2,21).

1.4. Conclusion

Early initiation of oral feeding and its tolerance were correlated with shorter hospital stays (≤9 days), supporting early refeeding.

2. Introduction

Acute pancreatitis (AP) is an acute inflammatory process of the pancreas and is one of the main causes of emergency department visits and morbidity and mortality worldwide, due to the inflammatory response that can cause local injury, systemic inflammatory response syndrome (SIRS), and organ failure [1,].

Risk factors or conditions associated with this disease include smoking, alcohol consumption, cholelithiasis, irritable bowel syndrome, and chronic kidney disease. Advanced age, male sex, and low socioeconomic status are also associated with increased risk. The most frequent etiology is biliary (>50%), followed by alcoholic (20%), hypertriglyceridemia (10%; range 10–52%), and post-endoscopic retrograde cholangiopancreatography (ERCP, 3–10%; infrequent).

Acute pancreatitis (AP) is characterized by a hypercatabolic state, and malnutrition is associated with increased morbidity; hence the importance of nutritional support. Hospital cohorts documented a 13.3% increase in hospitalizations for AP (2002–2005), reflecting a growing burden of the disease. Evidence supports initiating early enteral or oral feeding (within the first 24 hours) due to its immunological benefits, preservation of the intestinal barrier, and reduction of hospital stay. If oral feeding is not tolerated within 3–5 days, a nasoenteric / nasoejunal feeding tube is recommended. Targets of 25–30 kcal/kg/day and 1–1.5 g/kg/day of protein are suggested, individualized according to tolerance [2,3,4].

The global incidence is variable (5–45 per 100,000 inhabitants depending on the country, etiology, and risk factors) and shows an increasing trend, with a rise in older age groups (peak between 70–79

years). This gastrointestinal pathology is prevalent, and its mortality depends on the severity: up to 30% in severe forms. Approximately 80% of cases are mild; severe forms can reach a 30–50% mortality rate and require standardized hospital management. In general, 80% have a favourable (mild) course, while up to 20% can progress to necrosis and severe forms, with complications (e.g., early organ failure) and risk of death [5-8].

2.1. Objective

To correlate whether the onset of oral tolerance can be used as an indicator of recovery in acute pancreatitis and to describe its relationship with early refeeding and length of hospital stay. Secondary objectives: To evaluate the correlation between early oral refeeding, its tolerance, and length of hospital stay in patients with acute pancreatitis; to estimate the average number of patients with acute pancreatitis who experience a relapse after the introduction of oral feeding due to poor tolerance; and to estimate the average length of hospital stay in patients with acute pancreatitis.

2.2. Methods

A prospective, longitudinal, observational, and analytical study was conducted at the General Hospital of the Guatemalan Social Security Institute (Guatemala City) from 2023 to 2025. Patients over 18 years of age diagnosed with acute pancreatitis and hospitalized in Internal Medicine were included. Patients requiring invasive mechanical ventilation, pregnant, or with cancer, admission to another unit, or terminal illness were excluded. Demographic and clinical variables were recorded, including the date of initiation of oral feeding, tolerance and exacerbation, amylase/lipase levels (at admission and at 72 hours when applicable), severity, and length of hospital stay (discharge-admission). Categorical variables were summarized as frequencies/percentages. Normality was assessed using the Kolmogorov-Smirnov test, and nonparametric tests were used when normality was not met. The association between categorical variables was assessed using the chi-square test or Fisher's exact test. For the early onset outcome, prevalence ratios (PR) with 95% CI were estimated and statistical significance was considered at $p<0.05$. The analysis was performed in SPSS version 23.

3. Results

In a total of 101 patients with acute pancreatitis, early initiation of oral feeding occurred in 60.4%, and oral tolerance was achieved in 88.1% of cases. The majority of patients had a hospital stay of 9 days or less (69.3%). No significant differences were found related to age (p=0.718), sex (p=0.102), disease exacerbation (p=0.682), or clinical severity (p=0.182). However, relevant differences were observed in relation to hospital stay: patients who initiated oral feeding early had a significant reduction in days of hospitalization, with a mean difference of −3.69 days (95% CI −6.43 to −0.96; p=0.001).

Metabolic etiology showed a higher probability of early initiation of oral feeding compared to biliary etiology (PR 1.57; 95% CI 1.11–2.21). Correlation analysis between early initiation and length of hospital stay showed a coefficient $r = 0.414$ ($p < 0.001$), indicating a moderate association, with early initiation explaining 17.1% of the variability in length of stay. Furthermore, patients who initiated feeding early had lower baseline lipase levels and a faster decline in this enzyme at 72 hours in mild and moderate cases, while in severe pancreatitis, interpretation was limited by the small number of cases.

In the distribution of the data according to the variables (Table 1) it can be seen that there were no significant differences by age (45.3±17.7 vs 50.6±19.2 years; 95% CI of the difference −12.86 to 2.25; p=0.718), nor by sex; since the male patients showed a greater probability of starting early (PR 1.30), but the 95% CI 0.94–1.78 includes the unit and the p=0.102 did not reach significance.

Patients with exacerbations were less likely to initiate dietary tolerance (PR 0.66; 95% CI 0.33–1.31), although this difference was not statistically significant; it suggests an adverse effect, but the precision is limited. Oral tolerance showed a direction consistent with benefit (62.9% vs 37.1%; PR 1.51, 95% CI 0.75–3.00), without reaching $p<0.05$, probably due to sample size.

Compared to mild pancreatitis (reference), moderate pancreatitis had a higher probability of early onset (PR 1.39; 95% CI 0.93–2.06) and severe pancreatitis a lower probability (PR 0.42; 95% CI 0.07–2.29). Neither was significant (p=0.182), with wide intervals due to the low number of severe cases.

Figure 1 shows that the group with early start (≤24–48 h) had shorter stays compared to those who did not start feeding early. The distribution shows greater dispersion and several prolonged cases in the "No" group, supporting the association between early refeeding and shorter hospital stay, with a mean difference of −3.69 days (95% CI −6.43 to −0.96); p=0.001.

The graph shows that early initiation of oral feeding, along with adequate oral tolerance, is associated with a significant decrease in hospital stay. This finding supports the idea that oral tolerance not only represents the patient's physiological capacity to resume eating, but also constitutes a reliable clinical indicator of recovery in acute pancreatitis, reflecting the stabilization of the inflammatory process and a favorable progression toward hospital discharge.

On the other hand, the correlation between early initiation of oral feeding and length of hospital stay was evaluated (see Table 2). The coefficient obtained was $r = 0.414$ with $p < 0.001$, indicating a positive correlation of moderate magnitude (Cohen = 0.30 to 0.49). Since not initiating feeding early is correlated with longer hospital stays, early initiation is associated with shorter hospital stays.

The $r^2 = 0.171$ indicates that, in this bivariate analysis, early initiation explains 17.1% of the observed variability in hospital stay. This result is statistically significant ($p<0.001$) and clinically consistent with the findings in Table 1 (shorter mean length of stay when feeding is initiated early).

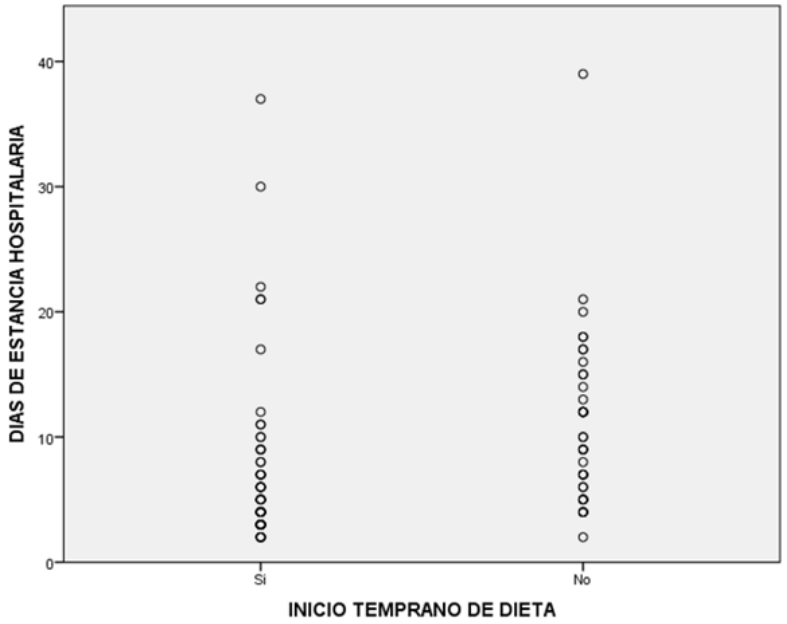

Figure 1: Hospital stay according to early initiation of oral feeding.

Table 1: Bivariate analysis of the onset of oral tolerance as an indicator of recovery in acute pancreatitis: association with clinical characteristics and days of hospital stay (N=101).

	Early start of diet			
	Yes (n = 61)	*No (n = 40)*	RP (95% CI)	*p* -value
Sex *f (%)*			1.30 (0.94 - 1.78)	0.102
Male	33(68.8)	15(31.25)		
Female	28(52.8)	25(47.16)		
Age X *(DE)*			Diff. Means -5.31(-12.86 - 2.25)	0.718
	45.3(±17.7)	50.6(±19.2)		
Days of hospital stay X *(DE)*			Diff. Means -3.69(-6.43 to -0.96)	0.001
	7.1(± 6.7)	10.8(± 6.8)		
Exacerbation of the disease *f (%)*			0.662 (0.33 - 1.31)	0.157
Yeah	5(41.7)	7(58.3)		
No	56(62.9)	33(37.07)		
Oral tolerance *f (%)*			1.51 (0.75 - 3.00)	0.157
Yeah	56(62.9)	33(37.10)		
No	5(41.7)	7(58.3)		
Severity *f (%)*				0.182
Mild	55(60.43)	36(39.56)		
Moderate	5(83.3)	1(16.7)	1.389 (0.93 - 2.06)	
Severe	1(25)	3(75)	0.417 (0.07 - 2.29)	
Etiology *f (%)*				0.123
Bile	29(51.8)	27(48.2)		
Metabolic	13(81.2)	3(18.8)	1.569 (1.11 - 2.21)	
Idiopathic	14(66.7)	7(33.3)	1.287 (0.86 - 1.90)	
Necrotizing	2(50)	2(50)	0.966 (0.35 - 2.65)	
Neoplasia	3(100)	0(0)	1.69 (1.07 - 2.64)	
Infectious	0(0)	1(100)	0.483 (0.04 - 5.39)	

RP: Prevalence ratio.

Table 2: Correlation between early diet initiation and hospital stay in patients with acute pancreatitis.

	Correlation		
	r	r^2	*P- value*
Early start of diet - Hospital stay	0.414	0.171	0.001

r: correlation coefficient; r^2: coefficient of determination; p: statistical significance value.

4. Discussion

The study findings demonstrate that early initiation of oral feeding can be considered a reliable clinical indicator of recovery in acute pancreatitis, based primarily on the significant reduction in hospital stay and the high tolerance rate observed (88%). The correlation between early initiation and shorter stay (r=0.414) reinforces the relevance of early refeeding as an integral part of management, consistent with explaining 17.1% of the variability in hospitalization time.

These results are largely consistent with current guidelines, including those of the American College of Gastroenterology (ACG 2024) and the European Society for Clinical Nutrition (ESPEN 2024), which recommend early reintroduction of oral feeding whenever there are no contraindications such as persistent vomiting, ileus, or a high risk of aspiration. Recent scientific evidence also supports the notion that prolonged fasting is harmful, while early oral or enteral nutrition helps reduce infectious complications and length of hospital stay.

Although serum lipase levels decreased more rapidly in patients who were refeeded early, the literature confirms that this enzyme should not be used as a criterion for determining severity or for deciding when to start feeding beyond the first 48–72 hours. The clinical decision should be based on tolerance and hemodynamic stability, as was the approach taken in this study.

No differences were found with respect to age, sex, or severity, which is expected in cohorts where mild or moderate forms predominate. The greater likelihood of early onset in metabolic etiologies could be due to a more stable clinical profile at admission, although small sample sizes in some etiologies require cautious interpretation.

Finally, although the study has limitations inherent to its observational design and the low representation of severe pancreatitis, the results are consistent with current evidence and support the use of early oral tolerance as a marker of recovery and as a strategy to reduce hospital stay and optimize nutritional management in acute pancreatitis.

5. Conclusion

The results show that early initiation of oral feeding in patients with acute pancreatitis is consistently associated with shorter hospital stays, with a significant difference of −3.69 days and a moderate correlation ($r = 0.414$; $p < 0.001$). Furthermore, the high rate of oral tolerance (88%) reinforces its usefulness as a clinical indicator of recovery, independent of age, sex, or severity in this cohort. Metabolic etiology showed a greater likelihood of early refeeding, which could influence more favourable clinical trajectories. Although the results are clinically relevant, their interpretation should consider the limitations of the observational design, the small number of severe cases, and the small representation of some etiologies, factors that restrict generalizability. Nevertheless, the evidence obtained supports the notion that early and well-tolerated reintroduction of oral feeding is a useful marker of recovery and a key element in reducing hospital stay.

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