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Clinical Spectrum, Etiology And Outcomes Of Pediatric Pancreatitis: A Tertiary Care Experience

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ABSTRACT

Background: Pancreatitis in children is an increasingly recognized condition with diverse etiologies and clinical presentations. This study aims to evaluate the spectrum of pediatric pancreatitis in a cohort of 30 children.

Methods: A prospective analysis was conducted on 30 pediatric patients diagnosed with pancreatitis in departments of Gastroenterology and General surgery, GMC Srinagar Kashmir from Dec 2018 to Dec 2023. Data on demographics, clinical presentation, laboratory findings, imaging characteristics, etiology, management, and outcomes were collected and analyzed.

Results: The median age of the patients was 12 years, with a male-to-female ratio of 1.5:1. The most common presenting symptoms were abdominal pain (90%), vomiting (72%), and fever (60%). Etiologies included idiopathic (33%), biliary (20%), trauma-related (13%) metabolic causes (13%) and medication-induced (6%).Serum amylase and lipase were elevated in 73% and 83% of cases. Imaging revealed pancreatic enlargement in 66% and necrotizing pancreatitis in 33.33% of cases. Management strategies varied, including supportive care (65%), nutritional interventions (13%), and specific etiological treatments (36.66%). The overall recovery rate was 100%.

Conclusion: Pediatric pancreatitis presents with a wide clinical spectrum, requiring a thorough diagnostic approach to determine the underlying etiology. Early recognition and appropriate management can improve outcomes. Further studies with larger cohorts are needed to enhance understanding and optimize treatment protocols.

Keywords: *Pediatric pancreatitis, Kashmir, Drug induced pancreatitis, Choledochal cyst.*

1. INTRODUCTION

Pancreatitis in children, once considered rare, is now increasingly recognized due to improved diagnostic techniques and greater clinical awareness. Acute pancreatitis (AP) is characterized by inflammation of the pancreas, often presenting with abdominal pain, vomiting, and elevated pancreatic enzymes. While the incidence of pediatric pancreatitis remains lower than in adults, it has been reported to be rising globally, with an estimated incidence of 3.6 to 13.2 cases per 100,000 children per year (1). The etiology of pancreatitis in children varies significantly and can be broadly classified into biliary, infectious, metabolic, traumatic, drug-induced, genetic, and idiopathic causes (2). Unlike adults, where gallstones and alcohol consumption are predominant causes, pediatric pancreatitis is frequently attributed to systemic illnesses, medications, or structural abnormalities of the pancreaticobiliary system (3). Recent studies suggest that genetic predisposition also plays a key role in pediatric pancreatitis, with mutations in PRSS1, SPINK1, CFTR, and CTRC genes contributing to recurrent and chronic pancreatitis (4).Despite advancements in diagnostic imaging and biochemical markers, the management of pediatric pancreatitis remains largely supportive, with hydration, pain control, and nutritional support being the mainstay of therapy (5). However, severe cases with complications such as necrotizing pancreatitis, pseudocyst formation, or organ failure necessitate more intensive care (6).The clinical spectrum and outcomes of pancreatitis in children vary widely, highlighting the need for further research in different populations to better understand regional variations in etiology and management. This study aims to analyze the spectrum of pancreatitis in 30 children, focusing on clinical presentation, etiology, and outcomes, to provide insights into the disease burden and management strategies in our population.

Aims and Objectives:

Aims:

To evaluate the clinical spectrum, etiology, management, and outcomes of pancreatitis in 30 pediatric patients.

Objectives:

1. To analyze the demographic and clinical presentation of pediatric pancreatitis.
2. To identify the underlying etiologies and risk factors associated with pancreatitis in children.
3. To assess laboratory and imaging findings in pediatric pancreatitis.
4. To evaluate the management strategies used and their effectiveness.
5. To determine the short-term and long-term outcomes, including complications and recurrence rates.

2. METHODOLOGY

Study Design:

This is a prospective observational study conducted to assess the clinical spectrum, etiology, management, and outcomes of pediatric pancreatitis.

Study Population:

A total of 30 pediatric patients aged less than or equal to 18 years diagnosed with pancreatitis were included in the study.

Study Setting:

The study was conducted at Departments of Gastroenterology and General surgery, GMC Srinagar, Kashmir India over a period of 60 months [Dec 2018 to Dec 2023].

Inclusion Criteria:

1. Children (aged 0-18 years) diagnosed with pancreatitis based on clinical, biochemical, and radiological findings.
2. Patients with at least two out of three of the following criteria:
    - Abdominal pain suggestive of pancreatitis.
    - Serum amylase and/or lipase levels elevated ≥3 times the upper limit of normal.
    - Imaging findings (ultrasound, CT, or MRI) consistent with pancreatitis.
3. Patients with complete medical records available for analysis.

Exclusion Criteria:

1. Patients with incomplete clinical or imaging data.
2. Cases of pancreatitis secondary to malignancy.
3. Patients lost to follow-up before outcome assessment.

Data Collection:

Data were collected using structured case record forms, including:

- Demographic details (age, gender).
- Clinical presentation (abdominal pain, vomiting, fever, jaundice).
- Etiology (biliary, infectious, metabolic, trauma, drug-induced, genetic, idiopathic).
- Laboratory parameters (serum amylase, lipase, liver function tests, lipid profile, calcium levels).
- Imaging findings (ultrasound, contrast-enhanced CT, MRI).
- Management strategies (supportive care, nutritional support, endoscopic or surgical interventions).
- Complications (pseudocyst formation, necrotizing pancreatitis, organ failure).
- Outcomes (hospital stay, mortality, recurrence).

Statistical Analysis:

Descriptive statistics were used for baseline characteristics (mean, median, percentages).

Data were analyzed using SPSS version 30. A p-value of <0.05 was considered statistically significant.

3. RESULTS

Demographic and Clinical Characteristics

Among the 30 children diagnosed with pancreatitis, the mean age was 12years (range: 5 to 18 years), with a male-to-female ratio of 1.5:1. The most common symptom was abdominal pain (_90%), followed by vomiting (72%) and fever (60%). (Table 1)

Table 1: Demographic and Clinical Characteristics

Characteristics	Frequency	Percentage
Total patients	30	100
Mean age (years)	12	-
Males	18	60
Females	12	40
Duration of symptoms before admission(days-median)	02	
Symptoms		
Abdomen pain	27	90
Vomiting	22	72
Fever	18	60
Jaundice	6	20
Severity		
Mild	16	53.33
Moderate	8	26.66
Severe	6	20

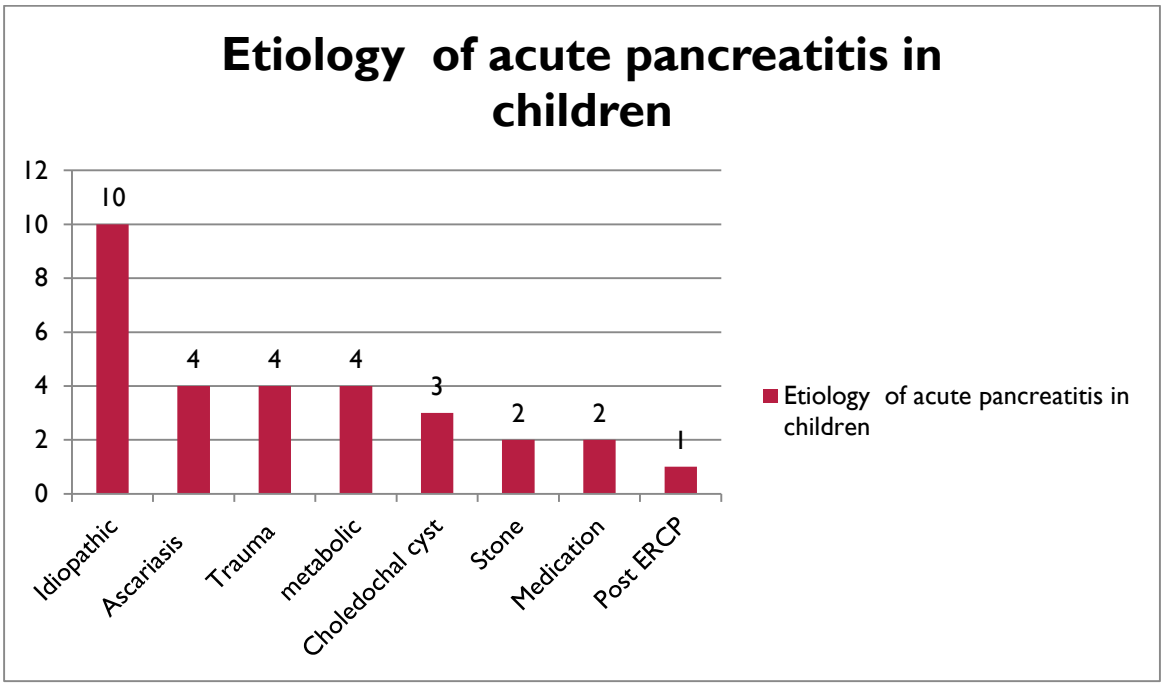
Etiology of Pancreatitis

The leading cause was Idiopathic (33%), followed by Biliary (worm and stone) (20%), trauma-related (13%), metabolic disorders (13%) and drug-induced (6%). (Table2)

Table 2: Etiology of Pancreatitis

Etiology	Frequency	Percentage
Idiopathic	10	33.33
Ascariasis	4	13.33
Trauma	4	13.33
Metabolic (Hypercalcemia, DKA)	4	13.33
Choledochal cyst	3	10
Stone	2	6.66
Medication related	2	6.66
Post ERCP	1	3.33

Graph 1: Etiology of Pancreatitis



Laboratory and Imaging Findings

Serum amylase and lipase levels were elevated in the majority of cases, and imaging showed pancreatic enlargement (66.6%), necrotizing pancreatitis (33.33%),

Management and Outcomes

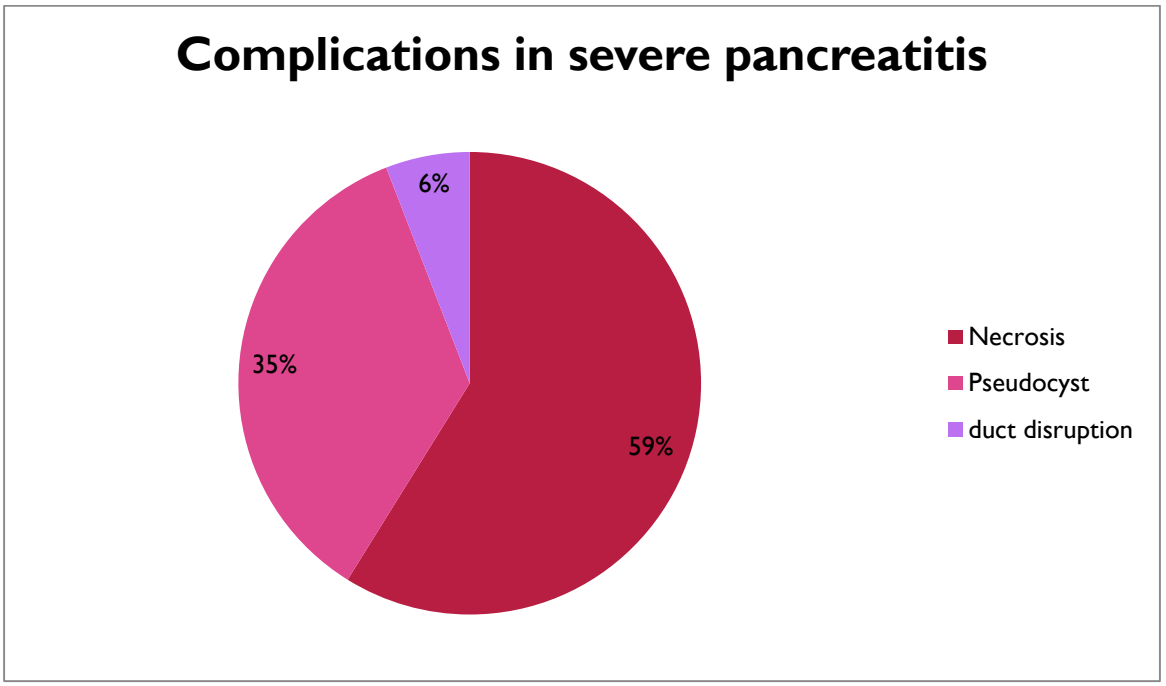
All patients initially received supportive care, 60% recovered by supportive care only, while some required nutritional intervention (13%), ERCP (20%), or surgical intervention (16%). (Table 3.)

Table 3: Management and Outcomes

Management strategy	**Frequency**	**Percentage**
Supportive care	30	100
Nutritional support	4	13
ERCP	6	20
Surgical intervention	5	16
Complications (n=17)		
Necrotizing pancreatitis	10	58.82
Pseudocyst	6	35.29
Duct disruption	1	5.88
Hospital stay(mean- Days)	4	
Mortality	0	0

Complications were seen in 17 (56%) of cases. The most common being Necrosis (58.88%) and pseudocyst (35.29%) followed by duct disruption (75.88%). (Graph 2)

Graph 2: Pie Chart of complications in severe pancreatitis



Key Findings:

- Idiopathic was the most common cause.
- Supportive care was effective in most cases, but some required ERCP or surgical intervention.
- Complications occurred in 56%, with 0% mortality.

4. DISCUSSION

Pediatric pancreatitis is an increasingly recognized condition, with a rising incidence due to improved diagnostic techniques and awareness. This study analyzed the clinical spectrum, etiology, management, and outcomes of 30 children diagnosed with pancreatitis.

Epidemiology and Clinical Presentation

In our study, the mean age of presentation was 12 years, with a male predominance (1.5:1). The most common symptom was abdominal pain (90%), followed by vomiting and fever. These findings are consistent with previous studies that report abdominal pain as the hallmark symptom of pancreatitis in children (1,2). The delay in presentation, with median symptom duration of 2 days before admission, is similar to reports from other tertiary care centers (3).

Etiology of Pancreatitis

The most common cause of pancreatitis in our study was Idiopathic (33%), followed by biliary (20%), trauma-related (13%), and metabolic (13%) causes. These results align with studies by Werlin et al. and Morinville et al., which report Idiopathic and biliary disease as a leading cause (4,5). Genetic mutations, such as PRSS1, SPINK1, and CFTR, have been implicated in recurrent pancreatitis, and their role needs further exploration in our population (6,7).

Laboratory and Imaging Findings

Serum amylase and lipase were elevated in most patients, which is a key diagnostic marker, though not always specific (8). Imaging findings revealed pancreatic enlargement (66%), necrosis (33%) similar to international reports on pediatric pancreatitis (9,10). While ultrasound is commonly used as an initial modality, MRI and CT play a crucial role in detecting complications (11).

Management and Outcomes

Most patients were managed with supportive care 60%, including fluid resuscitation, pain management, and nutritional support, which aligns with global management guidelines (12). A subset of patients required ERCP (20%) or surgical intervention (16%), particularly in cases of biliary obstruction or necrotizing pancreatitis (13,14). The mean hospital stay was 4 days, comparable to previous pediatric studies (15).

Complications and Prognosis

Complications occurred in 17 patients most common being pseudocyst formation (35%), necrotizing pancreatitis (58.82%), were observed, which are known risk factors for prolonged hospital stay and morbidity (16,17). Mortality in pediatric pancreatitis remains low, and in our study, it was 0%, consistent with published literature (18).

5. CONCLUSION

This study provides valuable insights into the clinical spectrum of pancreatitis in children. Early diagnosis, supportive care, and timely intervention for biliary and complicated cases can improve outcomes. Further studies with larger sample sizes and genetic screening will help better understand the disease burden and optimize treatment protocols.

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