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Acute Pancreatitis in Children in a Tertiary Care Hospital

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Abstract
Background: *Childhood pancreatitis is an uncommon but serious condition with incidence on the rise. It manifests as acute or chronic form with epigastric pain, vomiting and elevated serum amylase and lipase. The acute pancreatitis is an acute inflammatory condition of the pancreas that may extend to local and distant extra pancreatic tissues. It can be associated with severe morbidity and mortality.* ***Objective:*** *This study was conducted with the aims to determine clinical presentation, etiology and complications of acute pancreatitis in children.* ***Methods:*** *This study was conducted in the Department of Pediatric Gastroenterology, Hepatology and Nutrition of Bangladesh Shishu hospital & institute from January 2020 to December 2020. A total 60 patients were included in this study. The diagnosis of acute pancreatitis was based on diagnostic criteria made by INSPIRE group (If a child had any of the 2 of 3 criteria: the abdominal pain compatible with acute pancreatitis, elevated serum amylase and /or lipase level more than three times of upper limit of normal, imaging findings compatible with acute pancreatitis). The data concerned demographics, etiology, clinical features and hospital course.* ***Results:*** *The study included 60 patient's aged a mean 7.4. Female was 36 (60%) and male was 24 (40.0%). The most common clinical features were abdominal pain 58 (96.7%) which was localized in epigastric region 50 (83.3%), vomiting 40 (67%), nausea 36 (60.0%). Pain was severe agonizing in 50 (83%) patients. The average hospital stays was11.9+ 6.8. Leukocyte count were elevated in 21 (35.0%), CRP in 17(28%), serum amylase in 88%, serum lipase in 100% and hypocalcemia in 26 (43.3%). Most common cause was idiopathic 22 (36.6%), while choledocal cyst was 6 (10.0%), biliary stone 4 (6.66%), trauma 4 (6.7%). Common complications were pancreatic pseudocyst 4(6.66%) and ascites 3 (5%).* ***Conclusion:*** *Abdominal pain, nausea, vomiting were common presenting features of childhood pancreatitis. Common etiologies were idiopathic, choledocal cyst, biliary tract stone and trauma. Common complications were pancreatic pseudocyst and ascites.*

Keywords:*Acute pancreatitis, clinical features, etiology*

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I. Introduction

Acute pancreatitis is defined as an acute inflammatory process of the pancreas, with variable involvement of other regional tissues or remote organ systems. It may occur as an isolated attack or recur in distinct episodes with reversion to normal histology between two attacks. It is distinguished from chronic pancreatitis by the absence of continuing inflammation, irreversible structural damage and permanent impairment of exocrine and endocrine function [1].The etiology, clinical course and treatment of pancreatitis are different in children and adult [2]. Though acute pancreatitis is more common in adult, but its incidence in children has increased significantly over the past few decades [3].The incidence is estimated at 3.6-13.2/100000 per year [4,5]. Alcohol and gall stones are the etiology of acute pancreatitis in many adults and although some differences exit based on sex and ethnicity, these two etiologies account 60% of cases of acute pancreatitis in adults. However, the etiology in children is often drugs, infections, trauma, metabolic, toxins, systemic illness, inborn errors of metabolism, anatomical anomalies such as choledocal cyst and abnormal union of

pancreatobiliary junction and genetic predisposition as well as idiopathic causes [6]. The clinical manifestations can differ depending on the age of the child and the underlying etiology. According to the International Study Group of Pediatric Pancreatitis: in search for a Cure (INSPPIRE), two of three criteria must be fulfilled to diagnose AP in the pediatric population; namely abdominal pain, serum amylase or lipase levels that are three times the upper limit of normal and radiological findings diagnostic of AP [7]. Medical management of acute pancreatitis includes pain management with narcotics, intravenous fluid, nothing per oral and treatment of underlying causes [8]. As limited studies have been conducted in our country to assess pediatric AP, so the aim of this study was to describe the etiology, clinical characteristics of this disease, biochemical and imaging profile of children in a tertiary care hospital.

II. Material And Methods

This prospective observational study was carried out in the department of pediatric Gastroenterology, Hepatology and Nutrition from January 2020 to December 2020. Total 60 cases were enrolled in this study based on inclusion criteria. The diagnosis of acute pancreatitis is typically based physical examinations, laboratory testing and imaging studies. Children were included if they fulfilled any two of the three criteria: 1 abdominal pain suggestive or compatible with acute pancreatitis (abdominal pain of acute onset especially on epigastric region subsided on leaning forward) 2. Serum amylase or lipase level greater than at least three times of the upper limit of normal 3. Imaging like USG, CT scan or MRCP compatible with acute pancreatitis. Children having chronic pancreatitis, abdominal pain due to other cause left against medical advice or did not give the consent were excluded from study. Patient in the ward admitted through OPD or emergency were enrolled. Informed written consent were taken from the parents or guardian. Data was collected on a standard data sheet including the demographic information of each patient, complete history: including age of onset, fever, nausea, vomiting, jaundice, abdominal pain, history of trauma, drug history, family history, recent infections like mumps were included. Examination was done in each case including vital signs, hemodynamic stability, abdominal status like abdominal tenderness, rigidity, distension, ascites, bowel sound. Investigations including complete blood count, random blood sugar, serum creatinine, serum amylase, serum lipase, fasting lipid profile, serum calcium, HBsAg were performed in hospital laboratory. Plain x-ray abdomen and USG were done to establish the diagnosis and complications. CT scan was done to better define the extend of pancreaticnecrosis. In selected cases MRCP was done as indicated from patient's clinical condition and other radiological investigations.The collected data was analyzed using SPSS-23. All data were expressed as mean± Standard deviation (SD) or number or percentile as appropriate.

III. Results

A total 60 patients were enrolled in this study. Age range was 3-15 years with mean age was 7.4. Almost two third (60%) patients were female and 24(40%) were male. Regarding clinical presentation most common presenting feature was abdominal pain 58 (97%) which was localized in epigastric region in most of the patients 50 (83%). The most frequent characteristics of the pain was severe agonizing 50(83%), relieve by forward banding 30(50%) and radiation to back 28(47%). The second most symptoms were vomiting 40(67%), nausea 36(60%). Laboratory investigations assessed included leukocyte count, CRP, Serum amylase and serum lipase. Leukocyte count were elevated in 21 (35.0%), CRP in 17(28%), serum amylase in 88%, serum lipase in 100% and hypocalcemia in 26 (43.3%). Serum amylase values were most commonly within the ranges of > 500 to ≤ 1000 U/L (n=27, 45%), followed by ranges from > 110 - ≤ 500 U/L (n= 18, 30%). Serum lipase values most frequently ranges from > 500 -≤ 1000 U/L (n=32, 53%) followed by values over 1000 U/L (n= 21, 35%) Ultrasound scan of the abdomen was the imaging investigation performed which was able to pinpoint the diagnosis. In USG evaluation, the more common findings were edematous pancreas 34(56.7%), normal 14(23.3%), dilated pancreatic duct 10(16.7%), biliary sludge 6(10.0%). Computer tomography scan was done 33.3% patients and of them positive finding was found in 87% cases. MRCP was done in 5 cases and all of them had abnormal findings. Among complications Pancreatic pseudocyst was found in 4 (6.66%), ascites was found 3 (5%), pseudocyst with ascites was found 2 (3.33%), acute renal failure was found in 1 (1.66%) and shock was found in 1 (1.66%) patient. The mean duration of hospital stay was 11.9± 6.8 days 'hospitalization varied range from 6 to 30 days. The longest hospitalization (over 14days) occurred in children with the acute pancreatitis of biliary etiology 8 (13.3%) patients and shortest duration (7 days) in patients with acute pancreatitis of unknown etiology. Most of the patients 86.6% were managed conservatively with analgesia, intravenous fluids and pancreatic rest (nothing per oral, proton pump inhibitor etc.).13.3% of patients required surgical intervention.

Table I: Distribution of the study patients by demographic variable (n=60)

Age in years	n	%
2-5 years	18	30%
>5-10 years	40	67%
>10 years	2	3%

Sex		
Male	24	40%
Female	36	60%

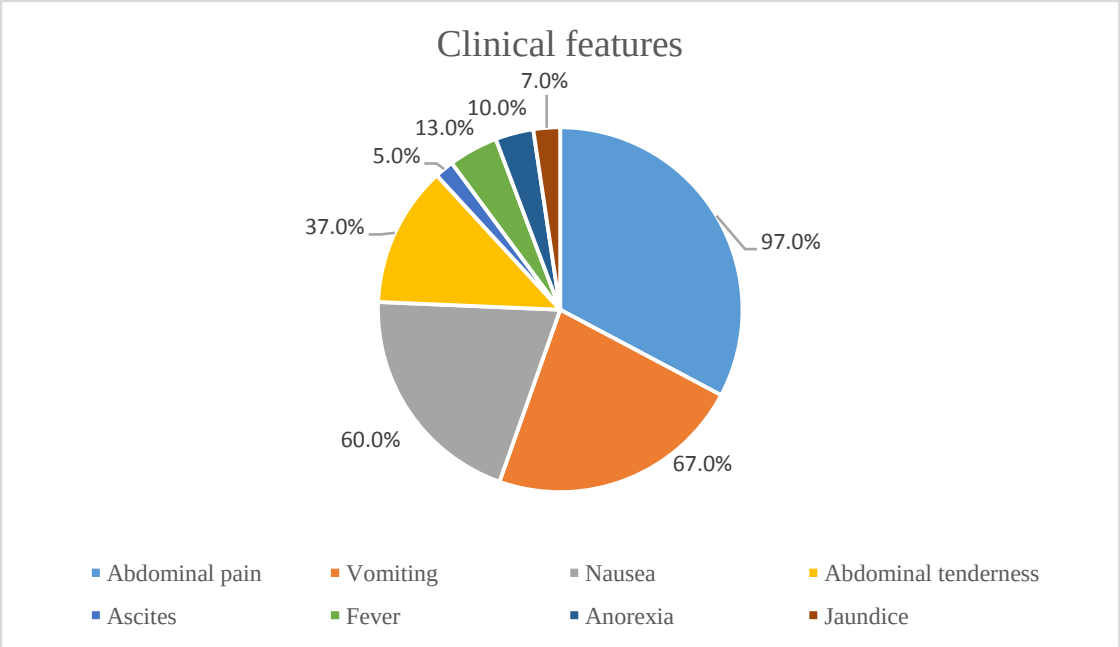

Figure I: Clinical features of the study participants (n=60)

Table III: Distribution of the study patients by pain location and characteristics of pain (n=60)

Pain location	n	%
Epigastric region	50	83.0
Diffuse	10	17.0
Characteristics of pain		
Severe agonizing	50	83.0
Relieve by forward banding	30	50.0
Exacerbation after taking heavy meal	30	50.0
Radiation of back	28	47.0
Dull aching	10	17.0

Table IV: Laboratory biomarkers of the studied participants (n=60)

Parameter	n	%
Leukocyte count (cumm)		
≤ 11,000	39	65.0
> 11,000	21	35.0
C-reactive Protein (CRP) (mg/dl)		
≤ 5	43	72.0
> 5	17	28.0
Serum amylase (U/L)		
≤ 110	7	12.0
>110 - ≤500	18	30.0
>500 - ≤1000	27	45.0
>1000	8	13.0
Serum Lipase (U/L)		
≤ 140	0	0.0
>140 - ≤500	7	12.0
>500 - ≤1000	32	53.0
>1000	21	35.0

Table V: Distribution of the study patients by USG finding (n=60)

USG finding	n	%
Normal	14	23.0
Edematous or enlarged pancreas	34	57.0
Dilated pancreatic duct	10	17.0
Peripancreatic or peritoneal fluid	8	13.0
GB stone	2	3.0
Biliary sludge	6	10.0

IV. Discussion

In the recent years, many studies have drawn attention to the increasing incidence of acute pancreatitis in both adults and children. The incidence of pancreatitis is increasing day by day but underdiagnosed in Bangladesh. Unfortunately, there are limited study on acute pancreatitis. So, this study will help us to clarify clinical condition of acute pancreatitis.

Mean age at presentation in acute pancreatitis was 7.4years which is similar that of Park AJ et al[3]. Female was found 60.0% and male was found 40.0% which was almost similar to Musabbir et al[7].

The diagnosis of acute pancreatitis based on clinical, laboratory and radiological findings. The most common symptoms among the studied children were the abdominal pain (97%) which was mostly described in epigastric region (83%) followed by diffuse (17%). Pain was severe agonizing in 83%, radiate to back in (47%) of patients. Vomiting was the second most frequent symptoms (67%) followed by nausea (60%). Abdominal tenderness was found in (37%) and ascites was found in (5%). Similar study was conducted by Fayyaz et al[8]. which showed that abdominal pain was the most common presenting symptoms100% which was epigastric in location in most of the patients (83.3%). In about 48.61% cases pain radiate to the back which was similar to our study. Common features were nausea and vomiting (79.1%) which was almost similar to our study.

In our study Leukocyte count were elevated in 21 (35.0%), CRP in 17(28%), serum amylase in 88%, serum lipase in 100% and hypocalcemia in 26 (43.3%). Serum amylase values were most commonly within the ranges of > 500 to ≤ 1000 U/L (n=27, 45%), followed by ranges from > 110 - ≤ 500 U/L (n= 18, 30%). Serum lipase values most frequently ranges from > 500 -≤ 1000 U/L (n=32, 53%) followed by values over 1000 U/L (n= 21, 35%) Al Hindi et al also found that Leucocytes count were elevated in 20 patients (35.7%), c reactive protein (CRP) in five (8.93%), serum amylase in 45(80.4%) which was also similar to our study[14].

All children had an abdominal ultrasound and characteristic changes were observed in 68% of patients, slightly more than in Werlin et al.[9] and Sanchez-Ramirez et al. study[10].

Computer tomography scan was done 33.3% patients and of them positive finding was found in 87% cases. Chlebowczyk et al. also found that out of 73.6% of children,60% visualized lesions characteristic for acute pancreatitis[2]. Computer tomography were performed only in 33.3% of cases in whom pancreas were not visualized in USG.Thus, it is suggesting that abdominal CT scan should be advised for diagnosis of acute pancreatitis when USG results are not clear. MRCP was done in 5 cases and all of them had abnormal findings. Musabbir et al. also found abnormal MRCP finding in 4 patients which was also similar to our study[7].

Most common cause of pancreatitis was idiopathic 22 (36.6%) and then biliary 10 (16. 6%). But due to lack of diagnostic facility we could not rule out other cause of pancreatitis like autoimmune pancreatitis and mutation analysis, representing limitation of this study.

Literature regarding complications of acute pancreatitis showed that pancreatic pseudocyst is the commonest complication in most of the available literature [12.] Second most complication includes ascites due to pancreatitis. Multiple case reports have been mentioned in literature: mainly from adult population. Frequency of pancreatic ascites in literature is from 1% to 3.4% which was slightly lower from our study [13.]

Among our patients, the mean duration of hospital stay was 11.9± 6.8 days, hospitalization varied range from 6 to 30 days. Chlebowczyk et al. [2]also found that the median hospitalization was 13 days, and the average was 13.8 days. However, Werlin et al.[9] found the average length of hospitalization was 24 days and by Sanchez-Ramirez et al. was 25.7 days which were longer than our study.

Most of the patients 86.6% were managed conservatively with analgesia, intravenous fluids and pancreatic rest (nothing per oral, proton pump inhibitor etc.).13.3% of patients required surgical intervention which was similar to Fayyaz et al[8].

Limitations of the study

This was an observational study with a small sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

V. Conclusion

The most common presenting features of acute pancreatitis were abdominal pain, nausea and vomiting. The most common location of pain was epigastric region. For confirmation of acute pancreatitis, both serum amylase and lipase level and abdominal USG are useful tools. Prompt diagnosis and meticulous supportive treatment reduce complications and is associated with good prognosis.

VI. Recommendation

This study can serve as a pilot to a much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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