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Original Article

Causal Evaluation of Pancreatitis in Children

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Abstract:

Pancreatitis in childhood is not common. It can be associated with severe morbidity and mortality. The role of clinical evaluation is vital as it can be misdiagnosed easily. This study was aimed to review the prevalence, etiology, presentation and outcome of pancreatitis in children. This cross-sectional study was conducted at the Department of Pediatric Gastroenterology & Nutrition of Bangabandhu Sheikh Mujib Medical University, Dhaka from January, 2017 through June, 2018. A total 43 cases of pancreatitis were included in this study. Pancreatitis was classified as acute pancreatitis(AP), acute recurrent pancreatitis (ARP) and chronic pancreatitis (CP) as per diagnostic criteria made by INSPPIRE (International Study Group of Pediatric Pancreatitis: In Search for a Cure) group. Among 43 children (age 10.1 mean ± 2.55,18 males); AP,14 (32.6%); ARP, 14(32.6%) and CP,15(34.8 %). Half of AP was idiopathic. Majority of ARP (28.6%) were idiopathic and CP (40%) had calcific pancreatitis. Majority of patients had vomiting followed by moderate to severe abdominal pain. In CP 4(26.6%) patient developed diabetes mellitus. Majority of pancreatitis in children is idiopathic. A sub-set of AP goes on to develop ARP and CP on follow-up and being in the idiopathic sub-set is a risk factor. CP is progress to endocrine and exocrine insufficiency. Early diagnosis, close monitoring and proper intervention are mandatory to reduce the potential morbidity and mortality.

Key words: Pancreatitis, Idiopathic, Pseudocyst.

Introduction:

Inflammation of the pancreas in children is rarely diagnosed and the etiologies are diverse. Pediatric acute and acute recurrent pancreatitis is significantly more common than it was previously presumed and depending on the nature of the disease it can lead to chronic pancreatitis. In the last 10-15 years, the incidence of pediatric pancreatitis has been on the rise. The incidence based on international data is 3.6-13.3 cases per 100000 children, while data regarding chronic pancreatitis are lacking[1]. There is great variability in the severity, clinical progression and late complications of the disease. A study from Pitsburgh[1] suggested an increasing incidence due to enhanced awareness, whereas a Melbourne study[2] attributed this to an increase in systemic diseases secondarily involving the pancreas and also of idiopathic etiology. Never the less, there is not much information from developing countries, there are only a handful of studies, mainly in the form of cases series from Asia[3-8], and none have documented any trend in the incidence of acute pancreatitis. Globally, there is paucity of literature regarding acute recurrent pancreatitis(ARP)[9-11] and chronic pancreatitis (CP)[12,13] in children. Recent work by Sellers et al[14] used a large US private health insurance database that, unlike most previous studies, captured inpatient admissions and outpatient encounters. The study confirmed the incidence of AP in children as 12 cases per 100000 persons per year. Thus, we analyzed our experience of pancreatitis with the aims of identifying the number of hospitalizations due to pancreatitis, natural history, etiology and outcome of pancreatitis in children.

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Materials and Methods:

From January 2017 to June 2018 consecutive children (up to 18 years of age) diagnosed with pancreatitis and managed by the Pediatric Gastroenterology & Nutrition,

Bangabandhu Shiekh Mujib Medical University, Dhaka, were included in this study. In this cross-sectional study, medical records of all children during the study period were recorded. Pancreatitis was categorized into three groups: AP (acute pancreatitis), ARP (acute recurrent pancreatitis) and CP (chronic pancreatitis) as per the definition laid down by the International Study Group of Pediatric Pancreatitis: In Search for a Cure consortium[15].

Acute pancreatitis was defined as any 2 of the following: abdominal pain compatible with AP, serum amylase, and/or lipase value 3 times or greater the upper limits of normal and imaging findings of AP[15]. Acute recurrent pancreatitis was defined as 2 or more episodes of AP with return to baseline in the intervening period[15]. Chronic pancreatitis was diagnosed in the presence of typical abdominal pain plus characteristic imaging findings or exocrine insufficiency plus imaging findings or endocrine insufficiency plus imaging findings[15].

After recruitment, clinical history, examination findings and investigation reports were recorded in a standard data sheet. In each case, history was taken in details regarding abdominal pain and associated symptoms like nausea, vomiting, fever, abdominal distension. History of drug intake, trauma, mumps and family history of pancreatitis were recorded. Examination of each case was done with special reference to vital signs, hemodynamic stability and abdominal status like tenderness, distension, ascites and bowel sound. Blood for amylase, lipase, complete blood count with hematocrit, serum calcium, fasting blood sugar, fasting lipid profile, serum ALT were evaluated. Imaging investigation like plain x-ray abdomen, abdominal ultrasonography was done for establishing diagnosis and complications. Enhanced CT scan of abdomen was carried out when no visualization of the pancreas was found at USG or to better define the extent of pancreatic necrosis. ERCP and MRCP were done when feasible. Consent was taken and ethical committee approved.

Statistical analysis was done by SPSS. All data were expressed as mean ± standard deviation or number or percent as appropriate. Data were tested using unpaired t-test and chi-square test, p-value <0.05 were considered significant.

Results:

During the study period, a total of 43 cases of pancreatitis 14(32.6%) AP, 14(32.6%) ARP and 15(34.8%) CP was managed in our department. The mean age of the study population was 10.1±2.55 (range 6-16) years, with a male to female ratio of 1:1.4. Majority of patients had vomiting followed by abdominal pain. There were no significant differences in BMI for age and height z scores in AP, ARP and CP. The mean age of children with AP (n=14) was 8.0±1.24 years with a male to female ratio of 1:1.3. The etiology of AP included idiopathic 7(50%), pseudocyst 4(28.6%), biliary sludge 2(14.3%). The mean age of children with ARP (n=14) was 11.1±3.08 years with a male to female ratio of 1:1.3. The etiology of ARP was 4(28.6%) idiopathic, 4(28.6%) pancreatic duct dilation, 2(14.3%) cholelithiasis, 2(14.3%) biliary sludge, 1(7.1%) pseudocyst and 1(7.1%) choledochal cyst. The mean age of children with CP (n=15) was 11.3±3.35 years with a male to female ratio of 1:1.5. In CP 6(40%) had calcific pancreatitis and followed by atrophy of pancreas 5(33.3%). Total 4(26.6%) children developed diabetes mellitus were diagnosed as CP.

Table-I: Comparison between acute, acute recurrent and chronic pancreatitis (n=43)

Variables	AP (n=14)	ARP (n=14)	CP (n=15)	p-value AP vs ARP	AP vs CP	ARP vs CP
Age	8.0±1.24	11.1±3.08	11.3±3.35	0.013[S]	0.007[S]	1.000
Male: Female	1:1.3	1:1.3	1:1.5	1.000	0.875	0.875
BMI for age(kg/m^2)	16.5±3.0	15.9±3.15	16.8±6.81	1.000	1.000	1.000
Height for age (Z-score)	-0.48±0.76	-0.97±1.29	-1.47±1.2	0.787	0.067	0.687
Vomiting	12(85.7%)	13(92.9%)	14(93.3%)	0.541	0.501	0.959
Abdominal pain	6(42.9%)	7(50.0%)	11(73.3%)	0.704	0.095	0.195
Fasting blood sugar(mmol/L)	4.85±0.65	5.10±1.19	6.23±1.61	1.000	0.013[S]	0.053
Outcome	Death:1		Diabetes:4			

P-value obtained from unpaired t-test and Chi-square test

Table-II: Cause of acute pancreatitis (n=14)

Cause	No of patients	Percentage (%)
Idiopathic	7	50.0
Pancreatic pseudocyst	4	28.6
Biliary sludge	2	14.3
Lymphoma	1	7.1
Total	14	100.0

Table-III: Cause of acute recurrent pancreatitis (n=14)

Cause	No of patients	Percentage (%)
Idiopathic	4	28.6
Pancreatic pseudocyst	1	7.1
Biliary sludge	2	14.3
Cholelithiasis	2	14.3
Choledochal cyst	1	7.1
Dilated pancreatic duct	4	28.6
Total	14	100.0

Table-IV: Cause of chronic pancreatitis (n=15)

Cause	No of patients	Percentage (%)
Calcific pancreatitis	6	40.0
Pancreatic pseudocyst	1	6.7
Dilated pancreatic duct	1	6.7
Choledochal cyst	1	6.7
Biliary sludge	1	6.7
Atrophy of pancreas	5	33.3
Total	15	100.0

Discussion:

In this study we have shown that pediatric pancreatitis is not uncommon and the number of hospitalizations due to pancreatitis is increasing recently. The incidence of pediatric CP was higher than in previous reports, at 2 cases per 100000 persons per year, and the prevalence was 6 cases per 100000 persons. The reasons for the increase are likely due to a combination of factors, including greater awareness about pancreatitis in children[16] and therefore a higher likelihood of testing for pancreatitis, clear definitions of AP and CP[17,18], increased referral patterns to tertiary care centers where most of these reports were derived[19]. Usually pancreatitis can affect all age groups, but is more common in 5-15 years age group. In the present study the mean age was 8±1.24 in AP, 11.1±3.08 in ARP and 11.3±3.35 in CP.

The diagnosis of pancreatitis can be made with reasonable certainty on the basis of clinical, radiological and laboratory findings. An overwhelming majority of patients of the present study presented with vomiting (85.7%, AP; 92.9%, ARP and 93.3%), followed by abdominal pain (42.9%, AP; 50.0%, ARP and 73.3%, CP). Similar study was conducted by Henedina et al[20] which showed abdominal pain was the most common presenting symptom in children occurring in 97.3% of cases and vomiting was present in 45.9% of cases.

The etiological spectrum of acute pancreatitis of this study is similar to the published literature except that proportion of idiopathic cases is higher in our series (13% to34% VS 50.0%)[21]. Local complications such as acute fluid collection and pseudocysts are common in acute severe pancreatitis. Studies in adult show that most acute fluid collections resolve spontaneously[22,23] but almost half of the pseudocysts and most pancreatic ascites (ductal disruption) require intervention[24,25]. In our study we have documented 4(28.6%) patients had pseudocyst; majority of acute fluid collections resolved spontaneously but 1 case required drainage.

After an episode of AP about 15% to 35% of children develop recurrence[19,21,26,27] and some of them progress to CP. So far, there is no pediatric study to document the dynamics of AP to ARP to finally CP. So, it is important to regularly follow-up all AP and ARP cases especially idiopathic one. Genetic predisposition is a definite risk factor for progression of AP to CP. It has been shown that most patients with genetic predisposition for pancreatitis present with AP in childhood and progress to CP over many years[26,27]. In this study we have not looked at genetic predisposition.

The largest study on ARP in children by Lucidi et al[11] in 76 children from Italy has shown that 30% hada known etiology such as structural or biliary causes, another 31% had a genetic predisposition and the remaining 39% were idiopathic. In our study, we identified either structural or biliary causes 35.7% of cases, but the remaining 28.6% were idiopathic. Witcomb[28] and Keim[29] described idiopathic ARP as a transition phase between AP andCP.

The idiopathic chronic calcific pancreatitis prevalent in this part of the world is often labeled as tropical chronic pancreatitis. The presentation is in young age (children/adolescents) and associated with pain, severe malnutrition, diabetes mellitus and exocrine insufficiency; it is also invariably associated with large pancreatic calculi[30]. However, a recent multicentric study in adults showed that the proportion of tropical chronic pancreatitis is just 3.8% out of 1033 cases of CP in India[31]. In our study 40% CP cases were calcific.

The limitations of our study were small sample size and there was an incomplete etiological work-up for ARP and CP like genetic mutation analysis.

Conclusion:

Pancreatitis is not uncommon in children in developing countries and there has been a significantincrease in the number of hospitalizations due to pancreatitis over the last decade. So, early diagnosis, appropriate etiological work-up, close monitoring and proper intervention are mandatory to reduce the potential morbidity and mortality.

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