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Peculiarities of Acute Pancreatitis in Children & appropriate management approach

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Abstract

Purpose: Most researches on Pancreatitis are done in adults but it is understudied in pediatric population. Here we share our experience with pediatric pancreatitis, highlight differences from adult pancreatitis, and point out appropriate management approach.

Methods: Records of children admitted with acute pancreatitis from January 2018 to January 2020 were reviewed. Unbiased treatment administered to all guided by the clinical condition. Demographic profile, cause, symptoms, image findings, Balthazar severity score, management, interventions required, outcome and recurrences were noted. Chi-square test was used to seek association between study variables.

Results: 23 patients, with age ranging from 4-12 years were found. Cause were trauma (7), Choledochal cyst(3), pancreaticobiliary maljunction(1), drug induced(1), but remained unknown in most(12) patients. Balthazar CT Severity index ranged from 1 to 9. Time to tolerate orals ranged from 2-12 days, hospital stay 3 to 20 days. Chi square analysis to seek association of hospital stay for ≤7or>7 days wth CT finding of necrosis was found to be significant (p-value 0.005), association between collection & time of feed ≤5or>5days was significant (p-value 0.02), and association between collection & hospital stay ≤7 or >7days was significant (p-value 0.007). 6 of 23 patients had recurrent episodes of pancreatitis. CT evidence of chronic recurrent pancreatitis was present in all 6.

Conclusion: Acute pancreatitis is extremely rare in infants and toddler. Etiology in children is different from adults. Even in presence of significant necrosis outcomes are good with conservative approach. Not all collections or necrosis require intervention though they may prolong stay and delay recovery.

Keywords: Pediatric Pancreatitis; conservative management; outcome

INTRODUCTION

Researches in Acute pancreatitis have grown recently in the past 2 decades with its growing incidence and knowledge of the disease. Most researches have been done in adults, and acute pancreatitis in Pediatric population is overall understudied. There are various severity scores to predict mortality which do not fit for pediatric population. The etiological background is also different in children. No clear management guidelines have been worked upon in pediatric pancreatitis [1,2]. With our research, we share our experience with the disease in pediatric population, highlight how it is different from adult pancreatitis, and also point out appropriate approach to its management.

Materials & Methods

We retrospectively reviewed records of all patients admitted with acute pancreatitis from January 2018 to January 2020 in Department of Pediatric surgery, at a tertiary care high volume centre in New Delhi. Ethical

approval was waived by the local Ethics Committee of University in view of the retrospective nature of the study and all the procedures being performed were part of the routine care.

Unbiased treatment of all patients with acute pancreatitis was carried out in our department guided by the patient's clinical condition. Intravenous analgesia with paracetamol or non-steroid anti-inflammatory drugs (NSAID) along with H_2 blockers were used in all patients along with intravenous fluids and parenteral nutrition support for inadequate oral intake more than 5 days. For patients not responding to above, in whom pain persists, oral or intramuscular opioid drugs were added in the treatment regime. At least, one imaging in the form of Contrast enhanced Computer tomography (CECT) of abdomen was done for all patients. Serial follow up ultrasound or CECT were carried out whenever required. Use of octreotide was limited to patients with clinical or radiological evidence of increase in collection.

Unnecessary interventions for asymptomatic collections and necrosis were avoided. Surgical intervention was limited to only in presence of sepsis in a toxic child. External drainage was done using ultrasound guided placement of pigtail catheter only for patients with persistent and symptomatic pseudopancreatic cyst. For patients with persistently high output and non-resolution of pseudocyst, internal drainage was done.

A note was made of the demographic profile, cause, symptoms, imaging findings, Balthazar severity score, management, interventions required, outcome and recurrences. The above data was critically observed and analyzed. We used Microsoft Excel to analyze the data. Chi-square test was used to seek association between study variables. At confidence interval of 95 %, significance level was set at <0.05.

Results

A total of 23 patients were admitted to our department with the diagnosis of Acute Pancreatitis. 10 of 23 patients were male, 13 of 23 were female. Age ranged from 4-12 years with mean age 8.78 years.

Cause of pancreatitis was not known in 12 of 23 patients. In other 11of 23 patients, cause was identified. There were 7 patients with traumatic pancreatitis, 3 patients with choledochal cyst and pancreaticobiliary maljunction, and 1 patient with drug induced pancreatitis.

Most common presenting symptoms were abdominal pain in all 23 patients, abdominal distension in 12 patients, vomiting in 10 patients.

CECT of abdomen was done for imaging in all patients. Time between admission to hospital and CECT ranged from 3 to 7 days, mean 5 days. At CECT, 14 patients were identified to have peripancreatic collection, 9 patients had evidence of pancreatic necrosis. 6 patients also had evidence of pleural effusion. A total of 11 out of 23 patients went on to develop pseudocyst pancreas, while only 9 of them required formal drainage. In 7 patients external drainage sufficed, while internal drainage was done in 2 patients.

Balthazar CT Severity index[3] in all 23 patients ranged from 1 to 9 (Mean 4.3). 7 of 23 patients had mild pancreatitis, 7 of 23 had intermediate pancreatitis while 9 of 23 had severe pancreatitis as per CT severity index.

All patients irrespective of Severity score had good outcome with no mortality.

Time taken to tolerate oral feeds ranged from 2-12 days (Mean 5.69 days). In 15 patients, oral feeding was well tolerated in ≤5 days, 8 patients had delayed oral intake to > 5days. Amongst 8 of those with delayed oral intake, Balthazar CT severity index ranged from 2-9, 1 of 8 had mild, 2 of 8 had intermediate, and 5 of 8 had severe pancreatitis.

Total duration of Hospital stay ranged from 3 to 20 days (Mean 9.65 days). 10 of 23 patients had a hospital stay of ≤7 days, 13 of 23 patients had a hospital stay of > 7days.

Intravenous NSAID or Paracetamol were used for analgesia sufficed in 19 of 23 patients, oral or intramuscular opioids were required in 6 of 23 patients. Somatostatin analogue or octreotide was used in 6 of 23 patients.

Intervention in the form of ultrasound guided pigtail catheter insertion were required in 9 of 23 patients, internal drainage was required in 2 patients. 1 patient underwent cystogastrostomy and 1 underwent cystojeunostomy.

Table 1 enlists results of chi square test while seeking association of necrosis and collection with time of

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feeds, hospital stay, and requirement of octreotide, opioid analgesia and intervention.

6 of 23 patients had recurrent episodes of Pancreatitis. 1 of these 6 patients had drug induced pancreatitis, 1 had choledochal cyst with pancreaticobiliary maljunction while in rest of the 4 patients, the cause was not known.

CT evidence of chronic recurrent pancreatitis was present in 6 patients, with calcification in all these 6 patients and dilated pancreatic duct in 1 patient.

Discussion

While only two etiologies, that is Gall stones and Alcoholism account for more than 60% of cases of Pancreatitis in adults [4,5], the cause in children is often diverse. In Children and adolescents gall stone disease and alcoholism might be the rarest of all causes, pancreatitis is often attributed to trauma, drugs, infections, metabolic diseases and Pancreaticobiliary maljunction with or without choledochal cysts [2,6,7,8]. In our study, the cause of pancreatitis was not known in 12 patients. There were no obvious other glands swollen as in mumps, no known or history of metabolic disorders in family, no chronic drug intake or history of trauma in these patients. In 11 patients the cause was identified, 7 patients had trauma preceding the attack, 3 patients and choledochal cyst and associated pancreaticobiliary maljunction, and 1 patient had history of chronic intake of antiepileptic drugs.

Presenting symptoms of childhood pancreatitis is no different from adults. Just like in adults, abdominal pain, distension and vomiting were the common symptoms [9,10]. Weizman et al [11] and Ziegler we al[12] also report abdominal pain to be the most common presenting symptom in children, present in around 82% with pancreatitis. In our study, abdominal pain was present in all patients as all children in our study were 4-12 years and could verbalize. None of them were infants or toddlers. Vomiting, lethargy, and irritability are more common in this age group along with jaundice when in association with choledochal cyst [12].

Severe acute pancreatitis leading to shock and multi organ failure has also been reported [5]. Fortunately, all our patients presented to hospital early, were promptly managed and there was no mortality.

CECT performed for all of our patients at 3-7 days of hospital stay showed that14 patients had peripancreatic collection, and 9 patients had evidence of pancreatic necrosis.

There are no universally accepted scores for assessing severity of acute pancreatitis in children.Alexandre F et al found Imaging based Balthazar score more promising in assessing the severity of acute pancreatitis in children[13]. Hence, we used this CT severity index to score our patients. Score in our patients ranged from 1 to 9 (Mean 4.3). 7 patients had mild pancreatitis, 7 had intermediate pancreatitis while 9 had severe pancreatitis as per CT severity index [3]. Irrespective of the CT index, there was no mortality in our study.

We use a more conservative approach towards management of Pancreatitis in children and have good outcomes. Unnecessary interventions for asymptomatic collections and necrosis were avoided. Surgical interventions such as necrosectomy were limited to patients with evidence of sepsis when the child is toxic. External drainage was done using ultrasound guided placement of pigtail catheter only for patients with persistent and symptomatic pseudopancreatic cyst. Only for patients with persistently high output and non-resolution of pseudocyst, internal drainage was planned.

Series of chi square tests that we conducted showed that presence of pancreatic necrosis did not delay tolerance to feeds, but did prolong hospital stay. No significant correlation was detected between requirement of opioids for pain management or of use of octreotide with presence of necrosis. Presence of Necrosis did not correlate with requirement of external drainage. In general, even in children with acute necrotizing pancreatitis, without surgical intervention and necrosectomy, outcomes were good.

Similarly, chi square tests conducted to see correlation of presence of collection and its effect on delay of feeds and prolonged hospital stay and it was found to be significant. Thus, presence of collection delays establishment of full feeds in children and also prolongs hospital stay.

Generally, outcomes were good in all our patients, only 6 patients had recurrent episodes. The cause of pancreatitis was not known in 4 of them 1 patient had drug induced pancreatitis as she was on antiepileptic

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drugs and they could not be discontinued.1 of our patients had pancreatitis in association with choledochal cyst and 1 recurrence has occurred 3 months after surgery for choledochal cyst.

Only 1 patient has CT evidence of pancreatic duct dilation, but there are no symptoms of chronic recurrent pancreatitis like pain or malnutrition in this patient. Hence no surgery is being planned for this patient currently.6 patients show pancreatic and peri-pancreatic calcification in CT imaging.

Conclusion

Acute pancreatitis in children is extremely rare in infants and toddler, and more commonly occurs in older children. Etiology in children is different from adults. A conservative approach to management is associated with good outcome. Even in presence of significant necrosis in children's outcomes are generally good with conservative approach. Not all collections or necrosis require intervention though they may prolong stay and delay recovery.

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Table 1

Variables compared	Chi square statistic	p-value	significance
Necrosis & time of feed ≤5 or >5days	0.196	1.67	Not Significant
Necrosis & hospital stay ≤7 or >7days	7.84	0.005	Significant
Necrosis & Requirement of pigtail drainage	0.175	0.66	Not significant
Necrosis & use of octreotide	2.58	0.11	Not significant
Necrosis & use of opioids for pain relief	2.58	0.11	Not significant
Presence of Collection & time of feed ≤5 or >5days	4.87	0.02	Significant
Presence of collection & hospital stay ≤7 or >7days	7.07	0.007	Significant

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