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Original Research Article

Clinical profile and outcome of newly diagnosed children with chronic pancreatitis presenting at a tertiary care hospital in Dakshina Kannada

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ABSTRACT

Background: Acute recurrent pancreatitis (ARP) and chronic pancreatitis (CP) are poorly understood conditions of childhood. Aetiology of CP in children is different from adults, very limited studies are available in pediatric population; hence this study was conducted.
Methods: This was a hospital record based retrospective study performed in the department of pediatrics, at Yenepoya medical college hospital, Mangalore. Children from 1 month to 16 years of age were included in this study. Demographic data, clinical details, laboratory parameters, imaging results, and treatment data were collected. The data was tabulated and examined in SPSS software v.24 for analysis.
Results: Sixteen children with newly diagnosed CP were included in the study. The median age of children diagnosed with CP was 12 years. Pain abdomen as presenting complaint was observed in all the children diagnosed with CP. All children were residents of Karnataka state. Calcific CP was seen in almost 50% of children. There was no history of tapioca consumption in any child diagnosed with CP. In more than 90% of the children, the aetiology was idiopathic.
Conclusions: CP is common amongst children from Karnataka, India. Calcific pancreatitis is a common form of presentation and constituted nearly half of children with newly diagnosed CP in our study. Growth failure and steatorrhea are common complications in children with CP. Aetiology in majority of children with CP in our study was idiopathic, and not related to tapioca consumption. Genetic studies to determine the genetic predisposition for CP in children may play a significant role in future.

Keywords: CP, ARP, Tropical calcific pancreatitis

INTRODUCTION

Acute recurrent pancreatitis (ARP) and CP are poorly understood conditions of childhood. Single center studies estimate that 9-35% of children with acute pancreatitis (AP) suffer from recurrent episodes and the incidence of CP is approximately 0.5 per 100,000 persons per year in young adults.[1]

Factors that predispose children to recurrent attacks of AP and progression from ARP to CP are unknown. Although alcohol and smoking have long been recognized as major risk factors for ARP and CP in adults, they are uncommon in the pediatric age group.[2] Recent single center studies have identified several genetic risk factors in children with ARP or CP, including mutations in cystic fibrosis transmembrane conductance regulator (CFTR), cationic trypsinogen (PRSS1), pancreatic secretory trypsin inhibitor (SPINK1), chymotrypsin C (CTRC) and carboxypeptidase 1 (CPA1) genes. Other risk factors include obstructive, traumatic, infectious and metabolic causes.[3]

Constant inflammation and irreversible pancreatic tissue destruction are hallmarks of the disease of CP which results in the gradual loss of both exocrine and endocrine

function.[4] It is a multifactorial disease, with a wide range of symptoms and geographic variation. The incidence of CP in the western population ranges from 8 to 10 cases yearly per 100,000 population, and the overall prevalence is 27.4 per 100,000 per year.[5] CP is thought to be caused by one of two different pathogenesis. Impaired bicarbonate secretion, which is unable to respond to increased pancreatic protein secretion, is one possibility.[6] Plugs are formed within the lobules and ducts as a result of this abundance of proteins. Calcification and stone formation are the results of this process.[7] The other theory proposes that digestive enzymes in the pancreas are activated intra-parenchymally (possibly due to genetic or external influences such as alcohol).[8]

Reduced pain and improved absorption are the main objectives of treatment. Inflammation, neuropathic mechanisms, and blocked ducts are all factors that contribute to the sensation of pain. The replacement of fat-soluble vitamins and pancreatic enzymes is generally recommended along with frequent, small, low-fat meals.[9]

There are only a few reports from the Indian subcontinent as a whole. The vast majority of research is based on studies of people in western countries. Several studies have shown that CP has changed its clinical profile in certain regions of the country.[10,11] Aetiology of CP in children is different from adults, very limited studies are available in pediatric population. Hence, we conducted this study to understand the aetiology, clinical profile, complications and outcome of children with newly diagnosed CP.

METHODS

Study details

This was a hospital record-based retrospective study. All the children diagnosed with CP (1 month to 16 years of age) presenting to emergency department, outpatients, and admitted for inpatient care under the department of pediatrics at Yenepoya medical college, Mangalore, during the study period of 1 year (January 2021 to January 2022), who fulfil the inclusion criteria were included in this study. Study was conducted after getting approval from institutional ethics and research committee.

Details of the investigations

Demographic data, clinical details, laboratory parameters, imaging results, and treatment data were collected and recorded on pre-structured pro-forma. The laboratory investigations reports included complete blood counts, liver function tests, blood urea and serum creatinine levels, serum amylase, serum lipase, serum calcium levels, serum vit D levels, fasting lipid profile, fasting blood glucose, post-prandial blood glucose, Hba1c levels. Results of the imaging studies - ultrasound abdomen and computerized tomography (CT) abdomen were noted.

Statistical analysis

The data collected was tabulated and examined in SPSS software v.24 for analysis.

RESULTS

Sixteen children with newly diagnosed CP were included in the study. In our study the median age observed was 12 years. Median duration of symptoms was 12 months (Table 1). A total of 7 males were observed in our study. Calcific CP was observed in 50% of the population. Pain in the abdomen as a presenting complaint was observed in all the 16 individuals. Episodic abdominal pain was observed in 12.5% of the patients. Continuous abdominal pain was observed in 87.5% of the patients. Associated abdominal distension was observed in 25% of the patients in our study (Table 2). All children were residents of Karnataka, India.

Table 1: Demographic data of children with chronic pancreatitis, (n=16).

Demographic data	N	Percentages (%)
Median age (IQR) (Years)	12 (3.7, 12)	
Median duration (IQR) of symptoms in months	12 (10, 14)	
Males	7	43
Residence (domicile) in Karnataka	16	100
Tapioca ingestion 6 months before presentation	0	0

Table 2: Clinical features of children with chronic pancreatitis, (n=16).

Clinical features	N	Percentages (%)
Calcific CP	8	50
Pain abdomen as presenting complaint	16	100
Episodic abdominal pain	2	12.5
Continuous abdominal pain	14	87.5
Associated vomiting	9	56
Associated abdominal distension	4	25

Steatorrhea/ diarrhoea was observed in 37.5% of the patients. Diabetes mellitus (DM) was observed in 6% of the patients. History of weight loss was observed in 62% of the patients. Weight for age <3rd centile was observed in 37.5% of the patients. Height for age less than <3rd centile was observed in 25% of the patients, pseudo-aneurysm of the abdominal vessels was observed in 18.7% of the patients. Family history of CP/ AP

/recurrent AP was seen in 6% of the patients. CP related to abdominal trauma was observed in 6% of the patients. Idiopathic CP was observed in 93.7% of the patients 18.7% of patients underwent pancreatic surgery (Table 3).

We compared the clinical features of calcific CP versus non-calcific CP and this is tabulated in Table 4. The clinical features, and complications of CP amongst calcific and non-calcific group were not significant when compared.

Table 3: Clinical features and outcome of children with chronic pancreatitis (CP), (n=16).

Clinical features and outcome	N	Percentage (%)
Steatorrhea/diarrhoea	6	37.5
DM	1	6
History of weight loss	10	62
Weight for age < 3rd centile	6	37.5
Height for age < 3rd centile	4	25
Pseudoaneurysm of the abdominal vessels	3	18.7
Family history of CP/AP/ recurrent AP	1	6
CP related to abdominal trauma	1	6
Idiopathic CP	15	93.7
Underwent pancreatic surgery	3	18.7

Table 4: Comparison of clinical features of calcific CP vs non-calcific CP, (n=8).

Clinical feature	Calcific CP	Non-calcific CP	P value
Episodic pain	7	7	0.7
Weight for age < 3rd centile	4	2	0.3
Height for age < 3rd centile	2	2	0.7
Clinical steatorrhea	2	4	0.3
Pseudoaneurysm of abdominal vessels on imaging	0	3	0.1

DISCUSSION

In our study, 50% of children with CP had calcific pancreatitis in contrast to the western literature where calcific pancreatitis is rare. Our study suggests that tropical calcific pancreatitis classically described in the Malabar region is prevalent in Karnataka as well. We did not find any relationship of CP with tapioca consumption. The results of our study were consistent with studies by Poddar et al.[12] In countries where cystic fibrosis contribute to a large proportion of children with CP-steatorrhea alone was a presenting complaint.[13] Peretti et al. in their review article have elaborated the tests in children with fat malabsorption.[14] DM was seen in 6% patients; consistent with other Indian studies. Bellin et al stated in their study that, pancreatic atrophy may be more common among children with DM, suggesting more advanced exocrine disease.[15] However, data in this exploratory cohort also suggest increased autoimmunity and hypertriglyceridemia in children with DM, suggesting that risk factors for type 1 and type 2 DM, respectively may play a role in mediating DM development in children with pancreatitis. Clinical steatorrhea and growth failure were highly prevalent in our study. Indications for surgery (in 3/16) were pain control, management of pancreatic duct disruption and management of pseudo-aneurysm of abdominal vessels.

CONCLUSION

CP is common amongst children from Karnataka, India. Calcific pancreatitis is a common form of presentation and constituted nearly half of children with newly diagnosed CP in our study. Growth failure and steatorrhea (exocrine pancreatic insufficiency) are common complications in children with CP. Aetiology in majority of children with CP in our study was idiopathic, and not related to tapioca consumption. Genetic studies to determine the genetic predisposition for CP in children may play a significant role in the near future. Pain management, duct disruption and pseudo-aneurysm of abdominal vessels were the indications for surgery in children with CP.

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