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Original Research Article

Clinical profile of children presenting with acute abdomen in a tertiary care centre of South Tamilnadu: a retrospective observational study

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ABSTRACT

Background: Acute abdominal pain is a common presentation in both outpatient visits and emergency room. It can be organic or functional, medical or surgical. We did an observational study to evaluate the clinical profile of children presenting with acute abdominal pain <7 days duration and analyse the various medical and surgical causes for this clinical presentation.
Methods: Children <15 years presenting with acute onset pain abdomen <7 days with or without fever, vomiting, loose stools or urinary symptoms and admitted in pediatric ward were included in the study. Out of the 205 children enrolled in the study, 120 were males and 85 were females.
Results: Only 15.6% of cases were of surgical etiology requiring elective or emergency surgical interventions. Among the 173 children diagnosed with variety of medical conditions, the most common condition presenting with pain abdomen was acid peptic disease (16%) followed by acute gastro enteritis(14%) and Urolithiasis(13%). Increasing prevalence of acute pancreatitis and type 1 diabetes mellitus (13 cases each) in children were observed.
Conclusions: Long term follow up of children presenting with mesenteric adenopathy without other significant pathology is warranted to avoid unnecessary empirical antituberculous treatment. Our study helped us to identify the different spectrum of etiologies across the three age groups (1-5 years, 6-10 years, 11-15 years) and some diseases were showing male or female predilection.

Keywords: Acute abdomen, Children

INTRODUCTION

Acute abdominal pain is a common cause of outpatient visits in any pediatric setting.[1] Some diseases require urgent surgical intervention while some may be of functional origin. A complete evaluation is the key factor approaching the disease and should include the patient's age, any trauma history, the onset and chronicity of the pain, the related symptoms and a detailed physical examination. The difficulty for a pediatrician begins when the history is not clear from the parents and if the child does not allow examining due to anxiety or pain. To identify the red flag signs indicating surgical emergency is of utmost importance. It can be the only manifestation of an underlying systemic illness like type 1 diabetes mellitus, porphyria etc. But many common medical conditions also present predominantly with pain abdomen as well. This study was conducted to analyses the common medical and surgical etiologies of acute abdominal pain in children.

METHODS

The objective of this study was to evaluate the clinical profile of children presenting with acute abdominal pain <7 days duration and analyse the various medical and

surgical causes for this clinical presentation. It was a retrospective observational study conducted in a tertiary care centre of South Tamilnadu (Velammal Medical College Hospital, Madurai, Tamilnadu).

Children (1 to15 years of age) presenting with acute onset pain abdomen <7 days with or without fever, vomiting, loose stools or urinary symptoms and admitted to the pediatric ward were included in the study. The diagnosis was made based on the clinical, biochemical and radiologic findings. Infants (<1 year) and children presenting with traumatic abdominal injury were excluded from the study.

Definitions used in this study

- *Acute appendicitis*: acute onset pain abdomen, with or without vomiting with right iliac fossa tenderness and confirmed by radiology (ultrasound or CT abdomen)
- *Abdominal tuberculosis*: Clinical features of fever, weight loss, altered bowel habit, abdominal pain and distension, positive contact history with AFB isolation or other suggestive picture in ascitic fluid analysis, caseating granuloma in biopsy specimen or suggestive colonoscopic/ radiological findings
- *Acid peptic disease*: Pain abdomen, vomiting with normal ultrasound and clinical response to proton pump inhibitors or diagnosis confirmed by upper gastrointestinal endoscopy
- *Acute pancreatitis*: pain abdomen with or without vomiting, with elevated amylase and lipase and suggestive radiologic findings in CT abdomen
- *Acute gastroenteritis*: Pain abdomen with loose stools and vomiting, without blood or mucus in stools, with or without fever
- *Colitis*: Pain abdomen with tenesmus, small volume loose stools with mucus or blood
- *Acute hepatitis*: pain abdomen with vomiting, with or without fever/ jaundice associated with raised liver enzymes
- *Cholelithiasis*: Pain abdomen with or without vomiting, with no other pathology but for radiologic evidence of gall stones
- *Dengue fever*: Confirmed by NS1 antigen or IgM antibody
- *Diabetic ketoacidosis*: Sick child with pain abdomen and fast breathing, Blood glucose>200 mg%. pH<7.3 and ketonuria
- *Mesenteric adenopathy*: pain abdomen with no other significant clinical, biochemical or radiologic finding but for at least three lymph nodes in ultrasonography with the peroneal diameter of 5 mm or more
- *Urinary tract infection*: Pain abdomen with frequent micturition or dysuria with evidence of pyuria/ bacteriuria or urine culture showing significant bacterial colonies or radiologic evidence of cystitis.
- *Urolithiasis*: Pain abdomen with radiologic evidence of renal or ureteric calculi.

The study was conducted after getting ethical committee clearance from the institute. Data collection was done by reviewing the case sheets from medical records department and contacting the patient over phone to collect additional details. Data was entered in Microsoft excel and analysis was done.

RESULTS

Out of the 205 children enrolled in the study, 120 were males and 85 were females (Figure 1). Only 15.6% of cases were of surgical etiology requiring elective or emergency surgical interventions (Figure 2). The commonest surgical cause for pain abdomen was appendicitis, out of the 19 cases 13 of them were in the adolescent age group with male predominance. The other surgical causes for acute abdomen were cholelithiasis, ileal perforation and torsion testis. A 13 year old child who presented with pain abdomen was diagnosed to have trichobezoar through upper GI endoscopy. She required surgery as the hair ball was only partially removable by endoscopy.

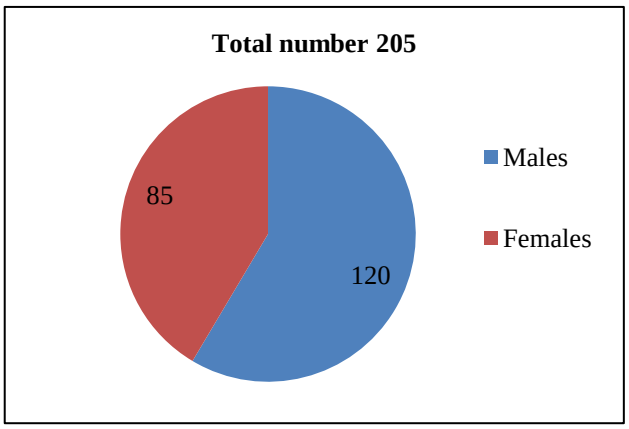

Figure 1: Percentage of boy's acute abdomen girls presenting with acute abdomen.

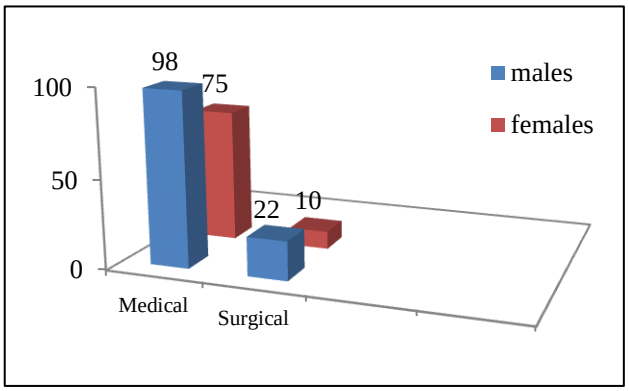

Figure 2: Percentage of medical and surgical cases in children 1-15 years.

Among the 173 children diagnosed with variety of medical conditions (Figure 3), the most common condition presenting with pain abdomen was acid peptic disease (16%) followed by acute gastro enteritis(14%) and Urolithiasis(13%). Children < 5 years (Figure 4) predominantly presented with pain abdomen, vomiting and loose stools and they were diagnosed to have acute gastroenteritis (17) clinically. The other common causes of pain abdomen in 1-5 years (Figure 4) were urinary tract infection (13), Dengue fever (5) and urolithiasis (5). In 6-10 years age group(Figure 5), the common diagnoses were dengue (10), urolithiasis (10), appendicitis (8), acid peptic disease (8) and mesenteric adenopathy (7) while in 11-15 years (Figure 6) acid peptic disease (18), appendicitis (11), acute pancreatitis (9) and urolithiasis (8) were common. The commonest cause for pain abdomen in boys was renal stones while in girls acid peptic disease was more prevalent.

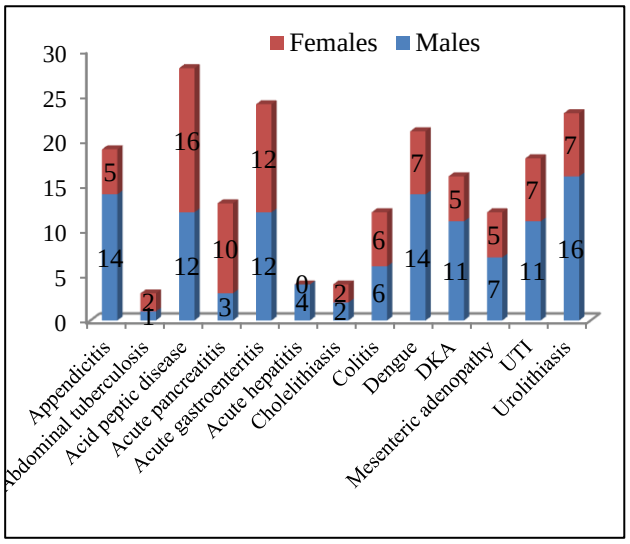

Figure 3: Common etiologies of acute abdomen in children 1-15 years of age.

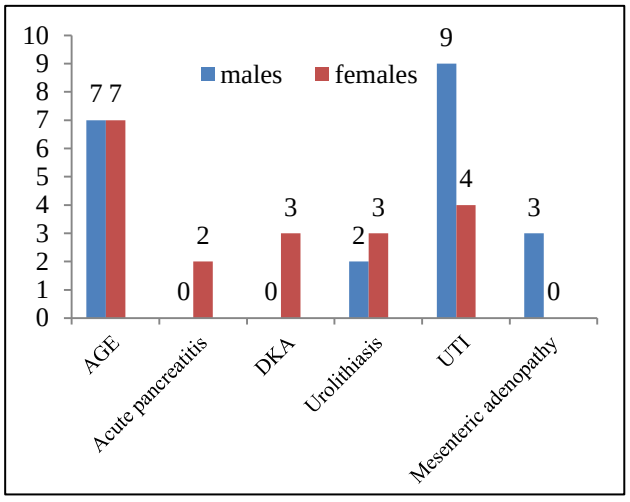

Figure 4: Clinical profile: 1 to 5 years, 59 children (35 males, 24 females).

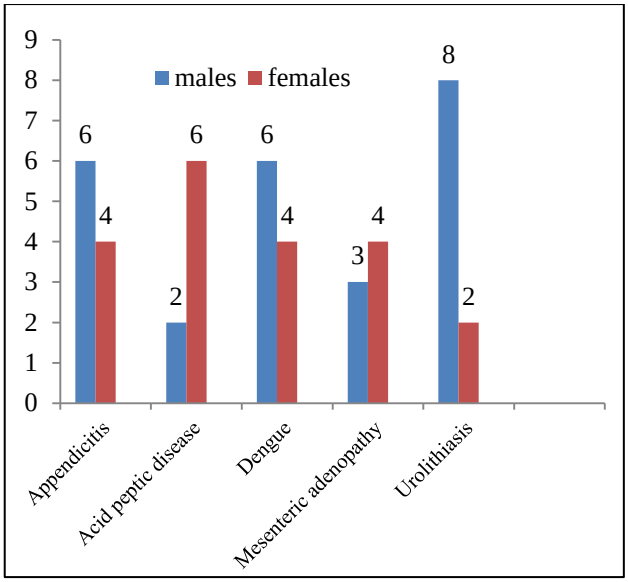

Figure 5: Clinical profile 6 to 10 years, 62 children (35 males, 27 females).

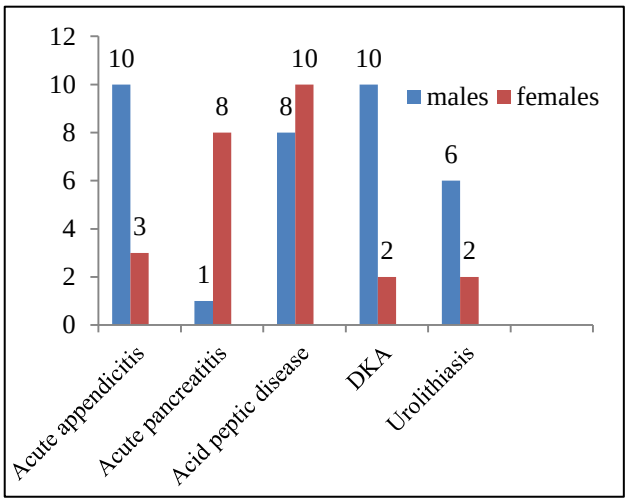

Figure 6: Clinical profile 11 to 15 years, 84 children (50 males, 34 females).

Increasing prevalence of acute pancreatitis (13 cases) in children was observed, which was mostly idiopathic in etiology and more in girls (10 out of 13). One case of pancreatic divisum was identified. Pain abdomen was the chief complaint in most of the newly diagnosed type 1 diabetes mellitus who presented as diabetic ketoacidosis. It had significant male predominance (11out of 16). Few children (12, 7 males) had pain abdomen as the sole complaint with no significant clinical findings but for mesenteric adenopathy (>1 cm) in Ultrasound.

DISCUSSION

Abdominal pain in children varies with age, associated symptoms, and pain location. It can be acute, recurrent or chronic in nature, based on the duration of symptoms. Although acute abdominal pain is usually benign and

self-limiting, there are uncommon but life-threatening conditions that require urgent care.[1] The most common non-surgical condition worldwide is gastroenteritis, while the most common surgical condition is appendicitis. Unlike the classic symptoms seen in adults, young children can display only lethargy or poor feeding in cases of appendicitis or can appear happy and playful between paroxysmal bouts of intussusceptions.[2]

Children >5 years can present with recurrent pain abdomen which may be purely functional. Mesenteric adenopathy in children is a common sonographic finding. In a developing country like ours, where tuberculosis is endemic, even insignificant adenopathy is treated with antituberculous drugs without proper evaluation while few cases with right iliac fossa are misdiagnosed as appendicitis and they undergo unnecessary surgery. In one series of 70 children with clinically suspected acute appendicitis, 16% had a final diagnosis of mesenteric lymphadenitis established by ultrasound, clinical course, or surgery.[3] Both medical and surgical causes can present with acute abdominal pain. The frequency of surgical intervention in patients presenting with acute abdominal pain varies from 1% to 20%, but the possibility of overlooking a serious organic etiology is a major concern for physicians.[4,5] Medical causes for acute abdomen can be abdominal or extra-abdominal inflammatory disorders which require proper evaluation and the right treatment.

The increased incidence of dengue fever in this locality was noted as it is an epidemic during the rainy season. Dengue fever with warning signs was predominantly presenting with pain abdomen and vomiting during the defervescence period. In a study published from Puducherry, 75% of patients of dengue fever with warning signs presented with vomiting and 35% with pain abdomen.[7]

The percentage of surgical cases in our study is significantly higher with increasing diagnosis of appendicitis, cholelithiasis and urolithiasis being made by radiology. A Turkish study showed increasing incidence of surgical causes of acute abdomen (20.7%).[4] The five most prevalent medical diagnoses were:

- Upper respiratory tract infection and/or complicated with otitis media or sinusitis (23.7%)
- Abdominal pain with uncertain etiology (15.4%)
- Gastroenteritis (15.4%)
- Constipation (9.4%); and
- Urinary tract infection (8%).

Among the medical conditions, rare diseases like type 1 diabetes and acute pancreatitis were increasingly identified. The increasing prevalence of T1DM in children, especially adolescents is recognized in the developed countries.[6] But no similar data is available in our country.

The increased incidence of acid peptic diseases in children was confirmed by upper GI endoscopy, of which 4 children were positive for helicobacter pylori infection. This can be attributed to the changing food habits and westernization in our country or due to increased diagnosis by endoscopy.A retrospective Japanese study published in 2004 concluded that *H. pylori* was significantly linked to duodenal ulcer and gastric ulcers in the age group of 10-16 years, but not in the age group of 9 years and under.[9]

A 14 year boy with severe malnutrition who presented with acute abdomen, loose stools and right iliac fossa tenderness was diagnosed as Crohn's disease based on CT enterography and colonoscopy. He had been treated as abdominal tuberculosis in the past with multiple courses of anti-tuberculosis drugs.

Only 2 confirmed cases of abdominal tuberculosis were diagnosed in children in our study. Diagnosis of abdominal tuberculosis is a diagnostic dilemma as there is difficulty in isolating the acid fast bacilli. Neither clinical signs, laboratory, radiological and endoscopic methods nor bacteriological and histopathological findings provide a gold standard in the diagnosis of abdominal TB.[8] Mesenteric adenopathy is another clue for abdominal Kochs. The causes of mesenteric adenitis have been reported to be viral, bacterial and mycobacterial infections.[10] Numerous bacteria have been demonstrated to be involved in mesenteric nodes: B. coli, staphylococci, streptococci, pneumococci, typhoid, paratyphoid and tubercle bacilli. In a Polish study performed on 127 children, Pain abdomen was the sole complaint (49.6%) in most of the children with mesenteric adenopathy.[11] Mesenteric adenitis is usually a self-limiting clinical condition characterized by fever, nausea, vomiting, diarrhea, diffuse or right lower quadrant abdominal pain and tenderness, and frequent leukocytosis. In our study, 12 children had only significant mesenteric adenopathy with negative Koch's workup and CT imaging, colonoscopy were normal. Their pain settled with antibiotics and supportive care. Hence they were treated symptomatically and kept in follow up.

Unlike few other studies, Henoch schonlein purpura, pophyria or Meckels diverticulum were not found in our study population. But as infants were not included in the study, cases of intussusceptions, volvulus or malrotation were not included in this study.

CONCLUSION

Our study helped us to identify the different spectrum of etiologies across the three age groups (1-5 years, 6-10 years, 11-15 years) and some diseases were showing male or female predilection. It also showed the increasing prevalence of urolithiasis and pancreatitis in children which may be due to the obesity epidemic and changing dietary habits. Also systemic causes of pain abdomen like

diabetic ketoacidosis and Henoch schonlein purpura should be ruled out. Long term follow up of children presenting with mesenteric adenopathy without other significant pathology is warranted to avoid unnecessary empirical antituberculous treatment.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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