Acute Cholecystitis in paediatric patients in Khartoum, Sudan

Ahmed Mohamed Adam Saeed[*], Sayed Ali[2], MAM Ibnouf[3]

Abstract

Introduction: Acute cholecystitis in children is a rare presentation, especially acalcular type. Many cases of acute cholecystitis in paediatrics were reported in western literatures, but few reports were published from tropical countries.

Purpose: The objectives of this study are to reflect on frequency of acute cholecystitis, its risk factors, diagnostic methods and outcome in children.

Patients and methods: A prospective data collection of five (2.5%) patients, one female and four males, with acute cholecystitis, collected among 200 paediatric patients presented with acute surgical abdomen over six months, between August 2006 through January 2007 in Khartoum teaching hospital plus another three elective cases (one male and 2 females) collected from private centre over two years.

Result: Five (2.5%) patients had acute cholecystitis and three elective cases. Five boys and three girls. Their ages ranged from 6 to 11 years. They were five cases of calcular cholecystitis. Thickened gallbladder wall, non shadowing echogenic materials or sludge in four patients, and pericholecystic fluid collection in two patients. No identifiable causes were found in four patients, one patient with acalcular cholecystitis discovered to have Salmonella infection and 2 childern with sickle cell disease.

Conclusion: Acute cholecystitis in pediatric is not common. High index of suspicion is required for correct diagnosis

Introduction

Acute cholecystitis is unusual pathology in children. Its diagnosis needs high index of suspicion. The vast majority of published papers are from western countries; with no major difference in clinical presentation whether its calcular or acalcular cholecystitis1. Acalculous cholecystitis usually occurs in critical ill old patients and those admitted to the intensive care units. It is rare in pediatric patients2. The common symptoms and signs are upper quadrant pain, nausea, vomiting, fever, jaundice and upper quadrant mass3.

The ultrasonographic criteria of acute acalcular cholecystitis consisted of thickening of the gallbladder wall (>3.5mm), gallbladder distension, non shadowing echogenic materials or sludge, and pericholecystic fluid collections4.

Complications of acute cholecystitis in children are life threatening. Avoidance of these complication demands prompt diagnosis and proper treatment5

Patients and methods

A total of 200 pediatric patients with acute surgical abdomen presented to paediatric surgical department, in Khartoum Teaching Hospital in the period August 2006 through Janaury 2007. Another three cases of gallbladderdisease were diagnosed in a Fedial Private Medical Centre. They were reviewed prospectively and only for features of gallbladder disease. Their demographic data, symptoms, clinical examination, radiological and laboratories findings were analyzed, as well as their treatment

1. Khartoum Teaching Hospital, Department of Paediatric Surgery.
2. Senior Paediatric Surgeon.Khartoum Teaching Hospital.
3. Professor of Surgery, Faculty of Medicine, Omdurman Islamic University.

Findings were analyzed, as well as their treatment and the outcome.

Purpose

The objective of this study is to review the frequency, risk factors, diagnostic methods and outcome of acute cholecystitis among children.

Results

Five (2.5%) out of 200 children with acute abdomen were diagnosed as acute cholecystitis (Two calcular and three acalcular cholecystitis) . Their ages ranged from 6 to 9 years. They were two acute calcular cholecystitis patients, with no evidence of haemolytic diseases. Three patients with acalculous cholecystitis with no identifiable predisposing factors, one of these three patients presented with generalized peritonitis, Although the gallbladder was acutely inflamed but it was not perforated (Fig 1,2and 3). The microbiological screening of her peritoneal fluid showed Salmonella infection, and her Widal test was positive. The duration of symptoms of children who presented as acute abdomen was 2 to 4 days. The most frequent signs and symptoms were right upper quadrant pain in 4, nausea in 5, vomiting and fever in 5, while right upper quadrant mass and jaundice each in a single child. All patients had leukocytosis. Liver function tests were normal in four patients.

Four patients had abdominal ultrasound at presentation. Gallbladder was thickwalled with nonshadowing echogenic materials or sludge in four patients, and pericholecystic fluid collection in two patients.

Emergency cholecystectomy was performed in the patient who had signs of generalized peritonitis. The other four patients were appointed

for interval cholecystectomy 6 to 8 weeks following conservative management. All patients were discharged in less than ten days, and subsequently were followed in the outpatient department.

Three patients were diagnosed over two year's time at Fedail Private medical Centre. They were two girls and a boy. Their age ranged from 4-11 years. Two of them had intermittent colicky abdominal pain and the third had recurrent urinary tract infection. Ultrasound showed gallstones in all the three patients. Two of them were known cases of sickle cell disease. Laparoscopic cholecystectomy was performed in these two patients wile the third was considered asymptomatic and advised to come for follow up

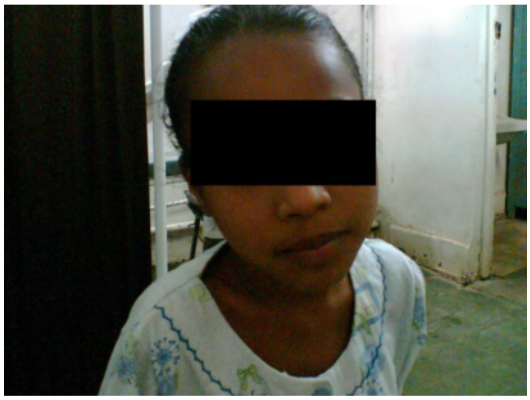

Fig1: child with acute Cholecystitis

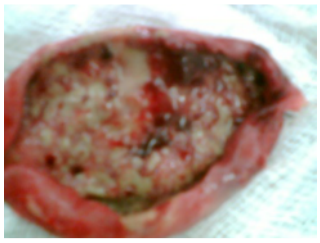

Fig2: severe necrosis in mouse of gallbladder

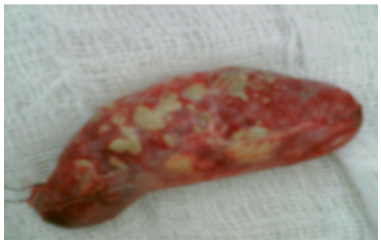

Fig3: Fiborenous exodates in gallbladder

Discussion

Although acute cholecystitis is straight forwards clinical diagnosis in adult, the diagnosis and management in pediatric patients represent real challenge to the treating physician. There are many reports in the literature that describe the clinical presentation and outcome of management of acute cholecystitis in children. The largest series is by Tsakayannis DE et al from USA, who reviewed retrospectively twenty five children with acalculous cholecystitis between 1970 and 1994. 19 out of these 25 patients had abnormal gallbladder function tests, noted by radionuclide hepatobiliary scan or cholecystography. Such facilities are not available in our hospital where we rely on clinical diagnosis supported with ultrasonic scan.

Three of our patients had surgery (one laparotomy for acute acalcular cholecystitis and two laparoscopic cholecystectomy for elective cases). Cholecystectomy is an effective treatment for gallbladder disease but, there is place for initial conservative treatment in some cases[6]. Occasionally, in cases of perforation the diagnosis may not be easy to be made preoperatively, carful history taken and examination supported by abdominal ultrasound, and radionuclide hepatobiliary scan or cholecystography is crucial in diagnosing hepatobiliary disorders in children[7].

Our findings in cases of acute acalculous cholecystitis are well matched with the observations reported by Yulevich A et al[8], who reported one case of acute acalculous cholecystitis due to salmonella infection in a six years old girl, with a signs of diffuse peritonitis, treated with cholecystectomy and intravenous ceftrixone[i]. Gallbladder dyskenesia as a cause of abdominal pain in children was investigated by Cay A, et al from Turkey[9]. Patients with gall bladder dyskenesia, present with biliary pain with no evidence of gall stone in ultrasonography. In such situation Cholecystokinin-stimulated hepatobiliary scan (CCK-HBS) will establish the diagnosis. He recommended CCK-HBS early in any patient with biliary colic who shows negative sonographic findings, but we do not have facilities for ERCP and manometery for the biliary system.

We considered a girl of four years of age with gallstone as asymptomatic. This is in keeping with conclusion of Russo EM et al[10] in Italy who investigated three paediatric patients with cholelithiasis and concluded that the disease is rare and often asymptomatic.

We had an urgent laparotomy in a six year old girl presented with generalized secondary to acalcular choplecystitis but we couldn't find perforation in the gallbladder. This goes well with the fact that perforation of the gall bladder complicating acute acalculous cholecystitis is a very rare complication. It may present as generalized peritonitis, pericholecystic abscess, cholecystoenteric fistula in its chronic

presentation, and very rarely the gallbladder may perforate[11]. We had 3 clear predisposing factors for gallbladder disease (one with Typhoid and two with sickle cell disease).

Conclusion

Proper history and physical examination are very important for diagnosis of gallbladder disease in children. Prompt medical treatment is important, and surgical treatment should be carried out immediately when it is appropriate.

In our current setup there are many areas for future investigations concerning the etiological factors of acute cholecystitis in pediatric patients. A number of difficulties still exist such as the lack and limitation of special investigatory tests.

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Transient Glutenopathy and Abdominal Tuberculosis; a cause or effect? Preliminary Report

Omayma M. Sabir[1]. Mohammed Osman El Hassan Gadour[2], Yassin Hag Mohamed Hamid[3]

Abstract:

Introduction: Tuberculosis remains an important disease worldwide. It is difficult to estimate its incidence in children. The association between intestinal tuberculosis and glutenopathy was not reported before.

Methodology: Three hundred patients who presented with chronic diarrhea to Gaafar Ibn Auf Specialized Children Hospital, Khartoum Sudan were investigated for intestinal tuberculosis and gutenopathy. The children were divided into two groups both were put on treatment for tuberculosis. However, one group was put on gluten free diet as well. The serological markers and intestinal biopsies were taken initially, six months after commencement of treatment and six months later. Also their clinical response to treatment was encountered.

Result: Out of the 300 children who presented with chronic diarrhea, 30 were diagnosed to have intestinal tuberculosis. Their ages ranged between 2-10years. At commencement of the study all the patients [30] had positive IgA and IgG antigliadin antibodies and anti tTG (table 1). The group which was put on gluten free diet showed rapid clinical, biochemical and histological response.

Conclusion: Despite the limitation of this preliminary study; we can conclude that ITB can cause transient glutenopathy and gluten free diet may facilitate clinical recovery in patients with ITB.

Key words: chronic diarrhea, Celiac disease, endomysial antibody, antigliden, villous atrophy

Introduction:

Tuberculosis in children is gaining relatively less interest worldwide probably because around 95% of infected children are sputum negative and so are less infectious. However, it has significant impact on health and economy of developing countries as it affects around 1.3 million children annually[1, 2].

TB can affect multiple systems simultaneously. Intestinal tuberculosis [ITB] has protean manifestations; one of these is chronic diarrhea. While investigating children with chronic diarrhea we noticed that almost all those who turned eventually to have ITB had positive serology for some markers of celiac disease.

We put a hypothesis that ITB may cause transient gluenopathy and we designed this prospective study to prove or disprove this hypothesis.

Methodology:

In the period January 2005- January 2007 we had 300 patients with chronic diarrhea in the gastrointestinal unit at Gaafar Ibn Auf Specialized Children Hospital, Khartoum Sudan.

History, clinical examination and investigations including ESR, serum albumin, and hemoglobin were performed for all children. Children who were suspected on clinical grounds to have ITB had mantoux test and ultrasonographic examination of abdomen. These children had immunological testing for evidence of celiac disease as well (IgA and IgG antigliadin antibodies and anti tissue transglutaminase (tTG)) and were subjected to upper gastrointestinal endoscopy and proximal small intestinal biopsy using Olympus video upper gastrointestinal endoscope [Olympus GIFP3 with diameter 8.5mm]. Histopathology after proper staining was done. The children were divided into two equal groups each composed of 15 children. Group [A] including those with tuberculosis and total villous atrophy with half [five] of those with subtotal atrophy. Group [B] included those with tuberculosis and minimal change atrophy and the remaining half of children with subtotal atrophy.

All the children were put on appropriate doses of anti-tuberculosis treatment (Streptomycin injections + Rifampicin +INH+ Pyrazinamide for two months and Rifampicin + INH for another 10months). Children in group A were put on gluten free diet as well.

Series of serological testing for celiac disease and intestinal biopsies were taken initially, six months after the start of treatment and further six months later

Out of the 300 children who presented with chronic diarrhea, 30 were diagnosed on clinical grounds (fever, malaise, ill health, chronic diarrhea, failure to thrive, and doughy abdomen) to have intestinal tuberculosis. This was further supported by the ultrasonographic findings (enlarged lymph nodes and thickened bowel with

1. Associate prof. Consultant Paediatrician Alnileen University
2. Prof. of Mdicine. Omdurman Islamic University.
3. Assistant Professor,Alnileen University ,Consultant Paediatrician

or without hepatomegally), positive mantoux test and raised ESR. Their ages ranged between 2-10years.

At commencement of the study all the patients [30] had positive IgA and IgG antigliadin antibodies and anti tTG (table 1). Out of these ten children had biopsy evidence of total villous atrophy (TVA), eight had subtotal villous atrophy (STVA) and 12 had minimal mucosal changes(MMC)(table 2).

Table (1) serology of cases at diagnosis (N=30)

	Group A		Group B	
Test	positive	negative	positive	negative
Ani tTG	15	0	15	0
IgA antigl	15	0	15	0
IgG antigl	15	0	15	0

Table (2) mucosal biopsy at diagnosis (N=30)

	Group A	Group B
TVA	10	0
STVA	5	3
MMC	0	12
Normal mucosa	0	0

STV =Total villous atrophy
STVA = Subtotal villous atrophy
MMC = Minimal mucosal changes
Group A on gluten-free diet
Group B on normal diet

Clinical course

In group A, the abdominal pain, diarrhea and malaise disappeared and the children stared to gain weight within the first week of treatment. They were kept in hospital for one to two weeks and there were no readmissions, while in group B diarrhea and malaise took up to two weeks to disappear, and the children started to gain weight after 10 days, stayed in hospital for up to three weeks and few of them were re admitted 2 – 3 times in the following six months.

After six months of treatment two patients from group A were dropped from the study because they were found to be HIV positive. All the children in both groups remained positive for IgG antigliadin. However, all the patients in group A and five in group B became negative for tTG (table 3).

Table (3) serology at 6 months (n=28)

	Group A		Group B	
Test	positive	negative	positive	negative
Ani tTG	0	13	10	5
IgA antigl	3	10	8	7
IgG antigl	13	0	15	0

After six months of re challenging with gluten rich diet the result was as follows: The 13 patients in group A remained negative for anti tTG and IgA antigliadin and 10 became also negative for IgG antigliadin antibodies, while seven patients in group B remained positive for IgG but all of them became negative for tTG and IgA antigliadin antibodies (table 4).

Table (4) serology at one year (N=28)

	Group		Group B	
Test	positive	negative	positive	negative
Ani tTG	0	13	0	15
IgA antigl	0	13	0	15
IgG antigl	3	10	7	8

Mucosal biopsy

After six months of treatment the intestinal mucosa of eight children in group A became normal, five continue to have MMC, while the mucosa of six out of the 15 children in group B became normal and nine continued to have MMC.(table 5)

Because of some difficulties, only two biopsies could be obtained from children in group A one year after treatment and it were found to be normal.

Table (5) mucosal biopsy after 6 month of treatment (N=9)

	Group A	Group B
TVA	0	0
STVA	0	0
MMC	5	9
Normal mucosa	8	6

STV =Total villous atrophy
STVA = Subtotal villous atrophy
MMC = Minimal mucosal changes
Group A on gluten-free diet
Group B on normal diet

Discussion

Although identifying mycobateria tuberculosis in small bowel biopsy is the gold standard finding for the diagnosis of ITB, this is not always feasible. Hence the clinical presentation in the appropriate setting when supported by some other investigations is an acceptable substitute to diagnose the condition[3]. Despite the non-availability of IgA endomysial antibody testing in our unit, the other tests can give reasonably reliable diagnosis of glutenopathy in our patients. This was further augmented with the histopathological picture and the good response to gluten free diet. IgA antiendomysial, IgA tTG and IgA antigliden antibodies fall with treatment and hence they were good non invasive monitors for the patients' response to treatment [4]. All our patients were initially positive for IgA anti tTG, IgA and IgG antigliadin. When the treatment was started; patients on gluten free diet showed remarkable and quick clinical recovery and after six month of treatment 100% and 76.9% of them turned negative for IgA anti tTG an IgA anti gliadin respectively compared to only 33.3% and 46.7% in group B. This indicates an excellent response to gluten free diet therapy. A paralleled histopathological recovery was observed. After six months of treatment with anti TB drugs none of the patients in both groups had persistent subtotal villous atrophy. Eight [61.5 %] patients in group A compared to six [40 %] in group B had normal intestinal mucosa and the rest of the patients had only minimal changes pointing to a good response to treatment. The absence of clinical, histopathological and immunological relapse after resumption of gluten rich diet in group A and the other indices in group B with the continuation of anti tuberculosis treatment indicate that the initial glutenopathy was a transient one and was probably related to the intestinal tuberculosis which was treated simultaneously. The exact mechanism behind this association is not clear. We could not come across clear direct association or causal relationship between intestinal tuberculosis and celiac disease in the literature. However, mucosal damage by intestinal infections was postulated before[5]. Intestinal TB may cause disturbance of the normal flora of the bowel and facilitate mucosal damage. Whether mycobacteria tuberculosis initiates direct local immunonological response involving T-cells and leading to this mucosal damage has to be further investigated. Also the possibility of more susceptibility of "celiac mucosa" to tuberculosis has to be studied. The remarkable clinical recovery in the patients who were put on gluten free diet highlights the importance of rapid resumption of the nutritional state in these patients. The role of gluten free diet in altering the intestinal bacteria flora in such patients and hence facilitating the clinical recovery reserves more focus. This study besides suggesting a causal relationship between ITB and glutenopathy in children is putting some questions: is there a similar relation in the adult diseases? Shall we look routinely for each disease when the other is present? Shall all such patients be put temporarily on gluten free diet? Have these patients got latent celiac? Is celiac disease an independent risk factor for acquiring ITB? Can genetic studies help in such a dilemma?

Conclusion

Despite the limitation of this preliminary study; [small number of children, inability to perform full serological test for celiac disease (e. g. anti endomyselial antibodies and anti reticulin antibodies) , isolate the mycobacteria tuberculosis in tissue or perform genetic studies] we can conclude that ITB can cause transient glutenopathy and gluten free diet may facilitate clinical recovery in patients with ITB . This finding is interesting and may have considerable impact on the diagnosis and management of both diseases if this is supported by other larger studies.

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