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Acute Alithiasis Cholecystitis in Children: Diagnostic and Therapeutic Approach in the Pediatric Surgery Department of the CHU of Conakry

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Abstract

Acute alithiasic cholecystitis (AAC) is the inflammatory disease of the gallbladder in the absence of gallstones. It is a rare pathology in children. The aim was to describe the clinical, diagnostic and therapeutic characteristics of this disease. **Materials and Method:** This was a 3-year retrospective study (January 2008 to December 2010) including 66 patient records collected for CAA. **Results:** The frequency of AAC was 3.57%, the mean age of the patients was 8 ± 3.52 years, and there were 36 boys and 30 girls. The main clinical features were right hypochondrial pain (66 cases), positive Murphy's (66 cases), fever (53 cases) and jaundice or sub-jaundice (51 cases). The main ultrasound signs were thickened vesicular wall 50 cas (75.76%), vesicular distension 50cas (75.76%) and positive ultrasound Murphy 47 cas (71.21%). Medical treatment was exclusive in 64 patients (96.97%) and surgical treatment in 2 patients (3.03%). **Conclusion:** Acute alithiasic cholecystitis is a rare pathology in children, the clinical picture is not very specific and abdominal ultrasound is the key to early diagnosis. Conservative treatment is the first choice in the absence of any complications.

Keywords

Acute Alithiasic Cholecystitis, Children, Medical Treatment

1. Introduction

Acute alithiasic cholecystitis (AAC) is an inflammation of the gallbladder that

occurs in the absence of gallstones [1] [2]. It is a rare condition in the pediatric population [2] [3]. However, it is the most common form of acute cholecystitis in children [1] [2]. It accounts for 50% to 70% of all cases of acute cholecystitis in childhood [4] [3]. The pathogenesis is multifactorial and probably results from biliary stasis, ischemia or both [1] [5]. The etiologies of CAA are multiple and diverse [1] [3] [4] [6]; most of these episodes occur during systemic infectious diseases [2]. Clinical diagnosis of AAC at an early stage is often difficult due to the lack of specific clinical features [2] [7]. Abdominal ultrasound is the main diagnostic radiological examination for AAC [5]. Late diagnosis can have devastating consequences due to the high risk of gallbladder perforation.

Treatment of CAA has a mandatory but not exclusive medical component and a surgical component, which is not mandatory [8]. Medical management consists mainly of supportive therapies and antibiotics. At an early stage, conservative treatment is sufficient. Surgical procedures such as cholecystectomy should be reserved for patients with complications [5].

The scarcity of studies on this condition in children in Africa, the diagnostic difficulties and the problem of management in our context led us to carry out this work.

The aim was to describe the clinical, diagnostic and therapeutic characteristics of the disease.

2. Materials and Methods

This was a retrospective descriptive study that spanned a period of 3 years (January 1st 2008 to December 31st 2010). It concerned 66 patient records collected for AAC in the pediatric surgery department of the Donka National Hospital (CHU of Conakry). All the records of patients in whom the diagnosis of AAC was retained and confirmed on abdominal ultrasound were included. AAC cases and cases in which the diagnosis of alithiasic cholecystitis was invalidated by abdominal ultrasound were not included.

The parameters studied were epidemiological, clinical, paraclinical and therapeutic;

The therapeutic protocol of the department;

It consisted of two components;

Exclusive medical treatment, which consisted of mono or bi antibiotic therapy depending on the clinical condition of the patients. It was made of third generation cephalosporin (ceftriaxone or cefotaxime) at a rate of 100 mg/kg/d in two doses in association with an aminoside (Gentamycin) at a rate of 3 mg/kg/d in one dose in slow IV. The oral relay was done with cefixime or a fluoroquinolone (ciprofloxacin 250 mg tablet);

Non-steroidal anti-inflammatory; morniflumate (Nifluril suppository 400 or 700mg) at a dose of 10mg/kg in two doses;

Antalgic-antipyretic: paracetamol infusion at 15 mg/kg every 6 h;

Anti-spasmodic; phloroglucinol 40 mg/4ml + trimethylphloroglucinol 40

mg/4ml (intravenous spasfon);

Ice bladder in the hypochondrium, twice a day for 30 min;

Fat-free diet;

Fluid therapy; 50 ml/kg/24hours (lactated Ringer's and 5% glucose serum alternately);

Surgical treatment: it consisted of cholecystectomy by the classical way. It was indicated in cases of failure of medical treatment or recurrence.

The sampling was exhaustive; the data were collected on a pre-established collection form with study parameters. Data entry and analysis were performed using Word, Excel and epi info version 5.3 software.

3. Results

Sixty-six cases of acute alithiasis cholecystitis were collected from a total of 1847 patients, *i.e.* a frequency of 3.57%. The average age of the patients was 8 ± 3.52 years with extremes of 0 and 15 years. The age range of 5 to 9 years was the most frequent with 32 cases.

There was a predominance of males, 36 males versus 30 females with a sex ratio of 1.20. Clinical characteristics (Table 1); Ultrasound signs of CAA (Table 2).

The biological examinations performed for etiological purposes were: Widal Felix (36 cases), Emmel test (23 cases), hemoglobin electrophoresis (4 cases) and

Table 1. Clinical features of acute alithiasic cholecystitis.

Clinical characteristics	Number (N = 66)	Percentage (%)
Pain at the HCD	66	100
Fever ≥ 38	53	80.30
Jaundice or sub-jaundice	51	77.27
Vomiting	38	57.56
Dark urine	17	25.76
Altered general condition	14	21.21
Positive Murphy's	66	100
Hepatomegaly	07	10.61
Palpable gallbladder	02	3.03

Table 2. Ultrasound signs of acute alithiasic cholecystitis.

Ultrasound signs	Number (N = 66)	Percentage (%)
Thick vesicular wall (>3 mm)	50	75.76
Vesicular distension	50	75.76
Positive ultrasound Murphy	47	71.21
Vesicular sludge (biliary sludge)	12	18.18
Peri-vesicular effusion	4	6.06

coproculture (2 cases).

The most frequent causes were: sickle cell disease 27 cases; typhoid fever 24 cases; unspecified causes 15 cases.

Treatment was medical in 64 patients (96.97%) and surgical in 2 patients (3.03%).

The average length of stay was 12.71 days.

4. Discussion

Acute alithelial cholecystitis (AAC) is a relatively rare condition in children and its spectrum is not well established [1] [3] [6]. In our study, it accounted for 3.57% of hospitalizations. Before the 2000s, Tsakayannis *et al.* estimated a frequency of 1.3 pediatric cases per 1000 cases of adult gallbladder disease [9].

The incidence of CAA in children has increased over the past 20 years. In Canada from 1993 to 2012, the incidence of pediatric cholecystectomy increased from 8.8 to 13 per 100,000 person-years. It was also reported that cholecystitis accounted for 9.3% of all pediatric bile duct procedures [10]. The mean age of 8.67 ± 3.52 years found in our series was comparable to that of Ji Haeng Lee *et al.* [6] who found a mean age of 8.5 ± 4.8 years. Yi DY *et al.* [7] in Seoul found a mean age of 6.28 ± 5.27 years. The diagnosis of CAA is often difficult due to the lack of specific clinical features [2]. In our study, right hypochondrial pain, positive Murphy's, fever and jaundice (**Table 1**) were the most common clinical features found. In the literature, clinical signs such as hypochondral pain, fever, jaundice and vomiting are present in less than half of the cases [11]. Abdominal ultrasound is the most reliable and accurate method for the diagnosis of AAC [2] [5]. In recent years, various sonographic criteria have been established for the diagnosis of AAC. Criteria such as increased vesicular wall thickness (>3.5 mm) gallbladder distension of more than 5cm in transverse diameter, pericholecystic fluid, localized tenderness (ultrasound Murphy), and the presence of bile sludge. The presence of at least two of these US criteria in addition to the absence of gallstones usually supports the diagnosis of CAA in pediatric age [1] [2]. Thickening of the gallbladder wall is the most reliable criterion, with a most reliable, with a specificity of 90% and 98.5% using the wall thickness cutoff of 3.0 mm and 3.5 mm, respectively; moreover, the sensitivity was 100% at 3.0 mm, but only 80% at 3.5 mm [1]. In our series, increased vesicular wall thickness of more than 3 mm, vesicular wall distension, and positive ultrasound Murphy were the main sonographic signs of AAC diagnosis. Most episodes of CAA occur during systemic infectious diseases [2] [5]. The etiology of this pathology is usually bacterial and very rarely viral [12]. In our study sickle cell disease and typhoid fever were the main causes of AAC. Acute cholecystitis is known as one of the surgical complications of sickle cell disease. It often follows chronic hemolysis, especially in homozygous sickle cell patients [13].

Typhoid fever is a systemic infection caused by certain species of Salmonella, particularly *Salmonella Typhi.* AAC in typhoid fever is usually a secondary com-

plication depending on the virulence of the bacterial strain or its resistance to treatment, especially in endemic areas. These bacteria reach the gallbladder through the bloodstream and have been shown to be tropic to the epithelium of the Gallbladder wall [1].

Chirdan *et al.* [14] described a series of 16 cases of CAA in children, an infectious cause was found in 8 of them including 2 cases of malaria and 6 cases of *Salmonella Typhi* infection.

Contrary to our result, Yi *et al.* [7] retrospectively analyzed 131 cases of AAC in children, Epstein Barr Virus infection was the most frequent cause identified in 38% of patients.

The current treatment of CAA in children is usually conservative [1]. In our series 96.97% of patients received exclusive medical treatment; however, 2 patients required open laparotomy cholecystectomy after failure of conservative treatment. In a similar study by Yi *et al.* [7] of 131 children diagnosed with CAA, only two patients (1.5%) underwent laparoscopic cholecystectomy. However, it should be noted that the indication for switching from conservative treatment to the surgical approach was not specified.

In the study by Lee JH *et al.* [6], conservative treatment was advocated in 61 patients (91.0%); however, no cholecystectomy was performed for the treatment of vesicular wall thickening.

In contrast, Chirdan *et al.* [14] described a series of 16 patients who developed CAA caused by S typhi. All patients in this series (except one) underwent laparotomy cholecystectomy as definitive treatment for AAC.

Our mean length of stay is higher than that of Yi *et al.* [7] in Seoul who found a mean length of stay of 9.47 ± 8.63 days.

5. Conclusion

Acute alithiasic cholecystitis is a relatively rare condition in children as evidenced by this study. Clinical diagnosis remains difficult due to the lack of specific clinical features. Abdominal ultrasound is the most reliable radiological examination for the early diagnosis of AAC. Sickle cell disease and salmonellosis were the main causes of occurrence of this condition. Conservative treatment should be the treatment of first choice. It is safe and effective when conducted in a hospital setting under medical supervision. Cholecystectomy should be reserved in cases of recurrence or complications.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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