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# *Acute Salmonella typhi Acalculous Cholecystitis*

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**Summary**

**Ogunrinde GO, Mado SM, Lukong CS, Ameh EA. Acute *Salmonella typhi* Acalculous Cholecystitis.** *Nigerian Journal of Paediatrics* **2006; 33: 56.** Despite the high prevalence of salmonella infection in developing nations, there are scanty reports of acute acalculous cholecystitis due to the organism compared to its relatively more frequent reports from the more industrialized countries with low prevalence of the infection. Even then, acute acalculous cholecystitis (AAC) is perceived to be an uncommon paediatric entity and a rare complication of typhoid septicaemia. A case of acute typhoid acalculous cholecystitis in a nine-year old girl, is presented. The diagnosis of AAC was established by ultrasonography and confirmed at laparotomy. Laboratory cultures grew *Salmonella typhi* from bile and citrobacter spp. from the blood. Following surgical intervention, the child had an uneventful recovery and was discharged three weeks after surgery.

**Key words:** Typhoid fever, acute acalculous cholecystitis

## Introduction

TYPHOID fever is highly prevalent in tropical countries including Nigeria.[1-4] It is associated with significant mortality and morbidity at all ages.[3,4] During the bacteraemic phase of the illness, the gallbladder is particularly susceptible to infection from the blood stream or through the biliary system.[5] It is therefore surprising that there is a dearth of information on gallbladder disease in children with typhoid fever, especially from the tropics.[6,7] This situation may probably be due to a low index of suspicion of complications involving the gallbladder in typhoid fever. Moreover, the inflammatory process in the gallbladder has been described as focal and modest compared to its bacteriological involvement in typhoid fever. It is also probable that the exquisite response of typhoid fever to the commonly used antibiotics could have prevented the more pronounced manifestation of gallbladder disease. Acute acalculous cholecystitis (AAC) has been described as being uncommon in paediatric ractice.[6,8] Since the first published case report in Nigeria in 1975,[9] only two other reports have been published.[6,10] In only two of the children was *Salmonella typhi* isolated.[10] With the upsurge of multidrug resistant typhoid fever and the expected increase in the manifestation of uncommon features,[11] it becomes imperative that clinicians be made aware of this possibility. It is hoped that this report of typhoid AAC will raise the level of awareness of this disease entity and increase the index of suspicion.

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## Case Report

A nine-year-old girl presented with eight days' history of fever, headache and abdominal pain. Fever was initially low-grade but became high-grade three days prior to presentation, and was associated with chills and rigors. The abdominal pain which was generalized and colicky, became more severe 24 hours before presentation. There was constipation but no diarrhoea. There was no history of jaundice, either in the past or during the current illness. She was treated with choloroquine at the onset of the illness without improvement. On examination, she weighed 14.0kg, was acutely ill, mildly dehydrated and febrile (39.5°C), but was neither pale nor icteric. There was no peripheral lymphadenopathy or oedema. The abdomen was full and there was generalized tenderness but no guarding. A tender and firm liver was palpable, four cm below the right costal margin along the mid-clavicular line. There was also a tender splenomegaly of three cm. The renal angles were normal as were the bowel sounds. Other examination findings were unremarkable.

A clinical diagnosis of typhoid fever was

made, while various specimens were obtained for laboratory investigations (Table I). Meanwhile, intravenous chloramphenicol at 75 mg/kg/24 hours in six-hourly divided doses was commenced while awaiting laboratory results. In view of the vomiting, 1.9 litres of intravenous half-strength Darrow's solution was infused on the day of admission to correct dehydration, provide maintenance fluid and replace ongoing losses.

By the fifth day of admission, the abdominal pain and vomiting had become worse in spite of therapeutic intervention. The pain became more localized to the right upper quadrant of the abdomen. Vomiting was profuse but was not bilious. Abdominal examination now revealed a markedly tender globular cystic swelling in the right hypochondrium below the enlarged liver. A diagnosis of acute cholecystitis complicated by gallbladder empyema was made. An abdominal ultrasonography showed a grossly distended gallbladder with normal wall thickness; no calculi were seen, while the common bile duct appeared normal. Meanwhile, the fever persisted, while abdominal pain and tenderness continued to worsen. In view of these, a laparotomy was performed on the 13th day of admission. The intra-operative findings included an inflamed and distended gallbladder containing bile. There was no stone in the gallbladder, the extrahepatic biliary tree and pancreas were normal, and the peritoneal cavity was clean. The liver and spleen were enlarged but otherwise, normal. The gallbladder was decompressed by a tube cholecystotomy. Post-operatively, chloramphenicol was replaced with cefuroxime (75 mg/kg/24 hours in two divided doses) and gentamicin (2.5 mg/kg/dose 8-hourly) because there had been no clinical improvement prior to surgery. The bile culture result obtained afterwards, showed a growth of *Salmonella typhi* that was resistant to chloramphenicol. The blood culture was however, reported to have grown Citrobacter spp. The patient made remarkable improvement and gained 3.5 kg within three weeks of surgery. The fever, vomiting, abdominal pain and headache subsided within 10 days following surgery. The cholecystotomy tube was removed three weeks post-operatively and a repeat abdominal ultrasonographic examination showed an empty gallbladder and normal extrahepatic biliary tree. The patient was discharged and is being followed up. She has remained asymptomatic and is scheduled to have an interval cholecystectomy to prevent recurrence.

**Table I**

*Summary of Investigations*

| *Investigations* | *Results* |
|---|---|
| Complete blood count | PCV: 0.31 L/L; WBC: 7.0 x $10^9$/L - Neutrophils 84%; Lymphocytes 16% |
| Haemoglobin genotype | AA |
| Urine microscopy/culture | No red blood or pus cells/ No growth |
| Blood culture | Citrobacter species isolated* |
| Bile culture | *Salmonella typhi* isolated** |
| Serum electrolytes and urea | $Na^+$ 140 mmol/L; $K^+$ 2.7 mmol/L; $Cl^-$ 104 mmol/L; $HCO_3^-$ 25 mmol/L; Urea 4.5 mmol/L |
| Liver function tests | Aspartate aminotransferase: 7 IU/L (5-22) |
| | Alanine aminotransferase: 24 IU/L (16-40) |
| | Alkaline transferase 42 IU/L (21-92) |
| | Total bilirubin: < 17 μmol/L (4-17) |

** Sensitive to amoxycillin-clavulanate, cefuroxime, ceftriaxone; resistant to chloramphenicol*

*** Sensitive to amoxycillin-clavulanate, amoxicillin, cefuroxime, ciprofloxacin; resistant to chloramphenicol and ampicillin*

*Figures in parentheses are ranges of normal values in the laboratory*

## Discussion

Typhoid fever is still a global concern with most cases occurring in the developing nations.[1] According to global estimates, about 21.5 million people were infected in 2000 causing over 200,000 deaths in the same year.[1] Prevalence studies from West Africa are not easily available but it is estimated that about 100 cases per 100,000 population occur annually.[1] It occurs most frequently in the 5-10-year age bracket although no age group is spared.[3] Of the 791 children admitted to the wards of the Departments of Paediatrics and Paediatric Surgery of Ahmadu Bello University Teaching Hospital, Zaria, in 2005, 118 were treated for typhoid fever giving an incidence of 14.9 percent. Not a single case of acute acalculous cholecystitis was documented among the 118 cases.

Among the common clinical features of the disease are abdominal symptoms and signs some of which suggest peritonitis. The abdominal tenderness is usually attributed to ileitis, hepatic involvement, ileal perforation and peritonitis. There is hardly any reference made to acute cholecystitis despite the fact that the gallbladder is often involved in the disease process.[5] Indeed, AAC has been reported as being rare in children with typhoid fever.[11,12] Our patient presented with typical features of typhoid fever: headache, fever, abdominal pain and constipation, while a clinical diagnosis of acute cholecystitis complicating the typhoid fever was confirmed by ultrasonography, surgery and culture of bile aspirate.

The apparent rarity of typhoid AAC may be due to a lack of adequate diagnostic facilities leading to missed diagnoses.[13] A low index of suspicion coupled with the high prevalence of other conditions, such as amoebic liver abscess, acute appendicitis, and ileal perforation, which may present with similar features as AAC, further militate against its early recognition.[7,14] The pre-operative diagnosis of acute cholecystitis has been low at 50 percent or less, in reported series.[6,10] In the available literature, Murphy's sign[15] was mentioned infrequently,[11,13,14] while there was no mention of sonographic Murphy's sign at all.[15] The diagnosis in the present case was initially that of typhoid septicaemia only; the associated cholecystitis was suggested only after a well circumscribed tender swelling was noted in the right hypochondrium. It has been suggested that many children with abdominal pain might have cholecystitis.[13] Abdominal pain and tenderness occur in 33-84 percent of children with typhoid fever[3,16] and the gallbladder is particularly susceptible in this illness.[5] Symptoms may be vague and many common features in adults may be uncommon or absent in children.[6]

It is obvious, therefore, that the index of suspicion needs to be high if cases of AAC are to be identified in children with typhoid fever. With increasing availability and use of ultrasound equipment, more cases of AAC in typhoid fever may be detected. In our case, *Salmonella typhi* was isolated from the bile. Unlike in a previous report where *S. typhi* was cultured from both bile and blood, another organism, Citrobacter species was isolated from the blood in the present patient. The Citrobacter species was probably a secondary infection. In any case, the patient responded satisfactorily to antibiotics, surgery and intensive nutritional rehabilitation. She is scheduled to have cholecystectomy to prevent recurrence. However, it is becoming increasingly more acceptable to have cholecystectomy done at the initial laparotomy unless in exceptional cases.[10] This will prevent increased morbidity of a second surgery and possibly missed cholecystectomies from loss to follow-up. It is nevertheless instructive that in some cases of infective AAC, surgery has been avoided with good results.[11]

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