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## Original Article

### **Biliary Stones: An atypical cause of abdominal pain in Paediatric age group**

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#### **Abstract**

**Objective:** To identify Paediatric patients with biliary stone disease presenting to a tertiary care hospital in order to determine the etiology, presentation and management.

**Methods:** Retrospective study of all cases of ultrasonographically proven biliary stones under the age of 15 years from January 1988 to December 2008. Data included their risk factors, complications, management and outcome.

**Results:** Total 32 patients were identified with biliary stones, treated in the hospital. Mean age at presentation was  $8.25 \pm 3.33$  years. Sixteen patients underwent cholecystectomy.

**Conclusion:** Paediatric cholelithiasis is an atypical and under-diagnosed cause of abdominal pain in childhood. True prevalence of the disease may be higher than reported. Appropriate surgical intervention is required in patients with symptomatic and complicated biliary lithiasis (JPMA 60:1042; 2010).

## Introduction

Cholelithiasis is a common clinical condition in the adult population with approximately 10% prevalence in industrialized countries.<sup>1</sup> So far this is considered to be a rare clinical problem in childhood with <2% prevalence in Paediatric age group.<sup>2</sup> The association of gallstones with haemolytic disorders is well established but other important causes include typhoid, long term total parenteral nutrition (TPN), phototherapy, extended high dose intravenous antibiotic treatment, and exchange transfusion.<sup>2-4</sup> However, there are a rising number of Paediatric patients with "idiopathic" cholelithiasis in last two to three decades.<sup>2,3</sup> There is scarce literature on this problem in our region and we present this study in order to reflect on possible etiological factors, mode of presentation and management in our Paediatric patients with biliary lithiasis.

## Patients and Methods

A retrospective review of all the patients under the age of 15 years was done who were admitted with a diagnosis of ultrasonographically proven cholelithiasis and/ or choledocholithiasis during January 1988 to December 2008 at the Aga Khan University Hospital Karachi, Pakistan. Data was collected regarding presence or absence of biliary symptoms, complications caused by gallstones requiring inpatient treatment and diagnostic procedures. Co-morbid conditions as well as predisposing factors were recorded to determine the etiology of biliary stones. The indications for surgical treatment were also recorded, and short term outcome of patients undergoing cholecystectomy was noted.

All variables were noted as open ended questions to enable maximum information gathering of individual cases. Data regarding each case was entered and analyzed for descriptive statistics using MS Excel 2007.

## Results

Total thirty two patients were included with ultrasound proven biliary stones; their mean age was 99±40 months (8.25±3.33 years). No significant gender preponderance was observed and we had 18(56%) males and 14(44%) females.

Table elaborates on the patients presentation as

**Table: Predisposing factors and presentation.**

Etiology of Symptomatic	Overall Number	Proportion	of
	(Percentage) n=32	Patients (n=22)	
None	12(38)	8(36.3)	
Haemolytic Anaemia	9(28)	5(22.7)	
Abnormality Of Biliary Tree	3(9)	3(13.6)	
Typhoid	3(9)	3(13.6)	
Abnormal Lipid Profile	1(3)	1(4.5)	
Antibiotics	2(6)	1(4.5)	

well as predisposing factors. Potential predisposing factors were identified in 15 patients, the most common being haemolytic anaemia. Three patients had an associated congenital abnormality of the biliary tree, including type IV choledochal cyst in two and an accessory papilla associated with pancreas divisum in one patient. Two patients had a history of more than 2 weeks of high dose Ceftriaxone therapy for severe urinary tract infection and meningitis respectively. History of enteric fever was present in three patients; however bile cultures were not available to confirm the etiological association. There were ten asymptomatic patients with biliary stones but a larger proportion (n=22/32; 69%) were symptomatic. About a quarter of all patients had complications at the time of presentation including acute pancreatitis in two, obstructive jaundice with deranged liver function tests in three and acute cholecystitis in three patients.

Surgery was done in sixteen patients. There were 9 open and seven laparoscopic procedures. Four asymptomatic patients underwent cholecystectomy due to underlying haemolytic disorder. Two patients required Common Bile Duct (CBD) exploration due to obstructive jaundice. One patient who had type IV choledochal cyst and associated biliary stones underwent exploratory laparotomy, excision of choledochal cyst and hepatico-duodenostomy. The mean post-operative follow up were 19±16 months in which no complication was observed.

One patient with recurrent pancreatitis and underlying pancreas divisum underwent Endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy and stone clearance. In, two patients with symptomatic cholelithiasis, treatment with ursodeoxycholic acid resulted in resolution of stones as well as symptoms. Five patients had resolution of symptoms on conservative treatment, two declined surgery and seven patients were lost to follow up.

## Discussion

Cholelithiasis is an uncommon condition in childhood, which is infrequent under the age of 16 years and rare in patients below 12 years.<sup>2</sup> However recent reports are showing an increasing number of Paediatric patients presenting with complicated biliary disease.<sup>5</sup> As opposed to the adult population, female preponderance is seen only after the age of 14 years<sup>2</sup> and most patients with gall stone disease are males which is also evident in this case series. Twenty eight percent of our patients had haemolytic anaemia, a finding established in previous studies.<sup>3</sup>

In this series, two patients who had a recent history of high dose parenteral Ceftriaxone therapy were found to

have tiny gallstones on ultrasound. It has been reported in literature that Ceftriaxone, a third generation parenteral cephalosporin, is capable of inducing reversible gallbladder sludge, with a reported incidence of 25-43%.<sup>6,7</sup> The most noticeable finding in this series was a large proportion (69%) of patients with symptomatic/complicated gallstones. The most common presenting complaint was right upper abdominal pain associated with nausea/vomiting. Another, important finding was a high proportion (25%) of Paediatric patients presenting with complicated cholelithiasis.

Literature also suggests that Paediatric patients with gall stones have a high incidence of biliary symptoms. Westrop et al have reported that 85% of children with cholelithiasis had right upper quadrant pain.<sup>2</sup> In other studies, biliary disease was found to be the cause in 29% patients with acute pancreatitis and other complications including acute cholecystitis, derranged LFTs, obstructive jaundice associated with choledocholithiasis<sup>5</sup>.

Two patients treated with ursodeoxycholic acid had a successful resolution. The most common indication of surgery in our subjects was complicated biliary stones, congenital abnormality of biliary tree and underlying haemolytic disease. The current strategy is shifting towards laparoscopic cholecystectomy with high success rates and no additional morbidity or mortality.<sup>6</sup> Open exploration is anticipated in patients requiring CBD clearance or correction of congenital biliary abnormalities. Endoscopic retrograde cholangiopancreatography was used safely and effectively in a patient with CBD stones, and demonstrates that this strategy could also be used in select group of Paediatric patients to avoid open CBD exploration.

This was a retrospective single hospital based series and hence the results cannot be extrapolated in general population. The definition of Paediatric age group may

differ for other investigators, which may have implications on generalizability of the results.

## Conclusion

The present study suggests that gall stone disease in children is an important cause of abdominal pain which frequently can result in complications. There is a need to develop awareness among Paediatricians and general practitioners in case identification and referral for appropriate surgical treatment of symptomatic/complicated biliary stones. More studies are required to establish the cause and appropriate treatment modalities for Paediatric patients with "idiopathic" gallstone disease.

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