

GALLBLADDER DISEASES IN CHILDREN

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Abstract

Background: Cholecystectomy is a relatively uncommon operation in children, and diseases of the gallbladder have been considered uncommon; where a review of the recent literature reveals that this entity is not rare, and our experience indicates that it is common enough to be considered in any patient with abdominal pain or jaundice.

Objective: The aim of this article is to review all cases of pediatric cholecystectomy at two institutions to determine indications for gallbladder surgery.

Subjects & Methods: The medical records of all children 16 years old and younger, who underwent surgery for cholelithiasis and/or cholecystitis at Al-Kademyia Teaching Hospital and Al-Eskan Central Teaching Hospital for Children between 1998 and 2003, were reviewed.

Results: Cholecystectomy was performed in 15 patients. The mean age was 5 years old (range: 1 to 12 years old). There were 9 boys (60%) and 6 girls (40%). The cause for gallbladder disease was identified as hemolytic disorder in 8 patients (53%). Family history of gallbladder disease was observed in 9 patients (60%). Splenectomy was performed in combination with cholecystectomy in 5 patients (33%). Postoperative complications were developed in 2 patients (13%).

Conclusion: Gallbladder diseases are being diagnosed with increasing frequency in the pediatric population. The single most important factor leading to the diagnosis is awareness that cholelithiasis and cholecystitis can occur in children.

Keywords: cholecystectomy, gallbladder disease, children

Iraqi J Med Sci, 2004; Vol.3(2): 158-161

Introduction

Cholecystitis in childhood was first reported in 1722 by Gibson. Little was subsequently written on this disease until Potter¹ reviewed the subject in 1938. Ulin, Nosal, and Martin² in 1952 reviewed cases in the literature up to 1948. After further review of the literature it can be concluded that cholelithiasis has been increasingly diagnosed in childhood during the past two decades. Whether the incidence is actually escalating or the diagnostic accuracy is improving because of the readily available use of ultrasonography is unclear³.

The gallbladder functions as a reservoir for bile storage and concentration. With meals, the gall bladder contracts as the sphincter of Oddi relaxes in response to the hormone cholecystokinin and related peptides. Following cholecystectomy, the flow of bile depends on the sphincter of Oddi⁴. Absence of gallbladder is rarely of physiologic

significance in the child or adult. Although congenital anomalies of the gallbladder are rare, acquired conditions of the gallbladder are of clinical importance in a significant number of infants and children. These conditions are usually related to (1) gallstones and their complications, (2) inflammation of the gallbladder with or without stones, and (3) dilatation (hydrops) of the gallbladder in response to a systemic ailment.

The most common cause of gallstones, at urban academic medical centers is hemolytic diseases where there is a large population of children with sickle cell disease⁴. More than 50% of children with sickle cell disease have evidence of cholelithiasis by the age of 18 years⁵. Thalassemia & spherocytosis are also associated with an increased incidence of gallstones. Other causes that are nonhemolytic include long term use of total parenteral nutrition, obesity, history of ileal resection, cystic fibrosis, oral contraceptive use, and pregnancy⁷.

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Received 12th November 2003; Accepted 16th February 2004.

Subjects & Methods

This is a retrospective study, including all children 16 years old and younger, who underwent surgery

for cholecystitis or cholelithiasis; at Al-Kademyia Teaching Hospital and Al-Eskan Central Teaching Hospital for Children between 1998 and 2003.

The medical records of 15 patients were reviewed and the results were analyzed, regarding the age, sex, clinical presentation, duration of symptoms, etiology, family history, type of operation and the complications. Infants with biliary atresia or choledocal cyst were not included in this series.

Results

Cholecystectomy was performed in 15 patients. The mean age was 5 years old (range: 1 to 12 years), there were 9 boys (60%) and 6 girls (40 %) as shown in Table 1. The cause for gallbladder disease was identified as hemolytic disease in 8 patients (53 %), other medical diseases or risk factors for gallstone disease were identified in 2 patients and included congenital heart disease (1 patient) and obesity (1 patient). In addition one patient had a history of abdominal trauma (Table 2). The family history of gallbladder disease was observed in 9 patients (60 %) and family history of hematological disease was positive in 5 patients (33 %).

Duration of symptoms varied from few days to 4 years with an average of 1year. Abdominal pain, the most common presenting symptom, was noted in 10 patients (66%). Jaundice or a history of jaundice was present in 9 patients (60%). One patient (6.6%) was asymptomatic & diagnosed incidentally.

The diagnosis depends on ultrasonography in 15 patients (100 %), while plain films of the abdomen demonstrated right upper quadrant opacifications in 2 of 10 patients (20 %) who had a radiographic examination performed.

In all the 15 patients cholecystectomy was performed & in 5 of them (33%) splenectomy was also performed at the same time (Table 3). There were 2 complication in the 15 patients (13%); wound infection and intraabdominal abscess, both of which occurred in the combined splenectomy & cholecystectomy.

Table 1: Age and sex in 15 patients with gallbladder disease

AGE	BOYS	GIRLS
1 year through 3 years	2	2
4 years through 6 years	3	2
7 years through 9 years	2	1
10 years through 12 years	2	1
Total	9	6

Table 2: Etiology factors in 15 patients with gallbladder disease

etiology	No.
Hematological disorders	8
Sickle cell disease	3
Spherocytosis	3
Thalassemia	2
Obesity	1
Congenital heart diseases	1
Trauma	1
No etiology discernible	4
Total	15

Table 3: Modalities of operative treatment

Operation	No.
Cholecystectomy	10
Cholecystectomy + splenectomy	5
Total	15

Discussion

In adults, gallbladder disease is more common in the female than in the male. However among children the rate is equal, or with male predominance. In our series of 15 patients; all of them under 12 years of age, there were 9 boys (60%) with a male to female ratio of 1.5:1. Nilsson⁸ concluded that until puberty the incidence is equal for boys and girls, and that after puberty there is a sharp increase in the incidence for girls. The incidence of gallbladder disease in boys in other studies varied from 41% to 57%^{9,10}.

A considerable amount has been written concerning the etiology of gallbladder disease. Unlike adults who usually undergo cholecystectomy for cholesterol cholelithiasis and have no other medical conditions, pediatric cholecystectomies were historically performed in patients with an underlying medical illness. The commonest cause of cholelithiasis in our series is hemolytic disease. It was found in 8 patients (53%). The same was noticed by Bruce⁹ and Seiler¹⁰. While others like Darlene¹¹ and McEvay¹² suggested a higher incidence of nonhemolytic cholelithiasis in recent years. We found 4 patients (26%) with no etiology for their gallbladder disease, while 1 patient was obese, one with congenital heart disease and another with abdominal trauma 6 weeks before the development of cholecystitis. Other causes of gallbladder disease were noticed by others^{4,9-11} like total

parenteral nutrition, ileal resection, cystic fibrosis, use of contraceptives and pregnancy.

The family history of gallbladder disease was positive in 9 patients (60%), and 5 of them (33%) had a family history of hematological disease. Seiler⁽¹⁰⁾ reported in his series that 40% of patients had family history of gallbladder disease and another 40% had family history of hematological diseases. While Bruce⁹ reported that 30% of his patients had family history of hematological diseases, but stated that family history was usually not helpful.

Duration of symptoms varied from few days to 4 years with an average of 1 year. Abdominal pain, the most common presenting symptom was noted in 10 patients (66%), while jaundice or a history of jaundice was present in 9 patients (60%). These results are similar to those by Bruce⁹ and Potter¹, although Ulin² reported an incidence of jaundice of 92%. This incidence of jaundice is far greater than that reported in similar adult series.

The diagnosis of cholelithiasis and/or cholecystitis; in our series depended mostly on ultrasonography (100%), although plain films of the abdomen demonstrated right upper quadrant opacification in 2 of 10 patients (20%) who had a radiographic examination performed. The high rate accuracy of ultrasonography and awareness of gallbladder diseases were responsible on the recent rise in gallbladder surgery in children and this was noticed by others^{3,11,12}. This awareness may be attributed to the routine use of ultrasound in the evaluation of abdominal pain. While the high rate accuracy make ultrasound replaces oral and intravenous cholecystography, which were not used in our patients.

Cholecystectomy was performed in 15 patients. Only in 5 patients (33%) it was combined with splenectomy for hematological indications. Choledocotomy was not needed in our patients. The indications for choledocotomy include; small gallstones, dilatation of the common bile duct, and common duct stones. In order to avoid operative complications to the small common bile duct in this age group, one should have a clear indication for exploration of this duct in children. Operative cholangiography is of great value and should be done, if there is indication to explore the common duct⁹.

There were 2 complications (13%) in the 15 patients, both of which occurred in those who had a combined splenectomy and cholecystectomy. Probably because this group of patients had a longer operative time, had to wait an extra day before starting to eat, and stayed in the hospital longer¹¹.

Although we do not have experience with pediatric laparoscopic cholecystectomy, but it seems that children enjoy the same benefits of laparoscopic cholecystectomy as adults. In a recent review Miltenburg et al¹³ showed that although pediatric laparoscopic cholecystectomy took longer time than open cholecystectomy, it resulted in less post operative narcotic use and a shorter post operative stay.

Conclusion

Gallbladder diseases are being diagnosed with increasing frequency in the pediatric population. The single most important factor leading to the diagnosis is awareness that cholelithiasis and cholecystitis can occur in children.

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