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Research Article

Clinicodemographic Study and Treatment Planning of Cholelithiasis in Children: A 5 Years Experience in Tertiary Hospital, Dhaka, Bangladesh

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Abstract: ***Background:*** Cholelithiasis in children is relatively rare but has been increasingly recognized in recent years due to improved diagnostic techniques like ultrasound. Gallstones are hardened deposits of digestive fluid, primarily bile, that can form in the gallbladder. The condition in children may have different causes and clinical presentations than in adults. ***Objectives:*** The aim of the study was to evaluate the management of cholelithiasis in children: A 5 years single centre experience. ***Methods:*** This study was performed in the Paediatric Surgery Department of Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh from January'2008 to December'2012. All patients after admitting were diagnosed clinically by history and laboratory investigation. Radiologically, only by ultrasography (USG) of hepatobilliary system was performed. All patients were treated by elective cholecystectomy by open method. Statistical analyses of the results were be obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-22). ***Results:*** Among the 31 patients, male was 19(61.3%) and female was 12 (38.7%) patients. Male: Female was 1.6:1. Age ranged (4-16) years and mean were 9.08± 2.98. 61% patients were ranged from 11years to 16 years. Etiology of gall stone in children mostly (73%) was idiopathic. Most (45.2%) of the patients presented with right upper quardent (RUQ) pain. ***Conclusion:*** Owing to development of diagnostic tools, recently increasing cholelithiasis in children. So, our study was to review the cholelithiasis in children and treatment plan. In our study most of the causes of Cholelithiasis in children was idiopathic. Male predominace found in children in contrary to adult where female was predominant.
Keywords: Cholelithiasis, Ultrasound. Gallstones, Digestive fluid, Primarily bile, Gallbladder.

INTRODUCTION

Cholelithiasis in children was frequently reported due to development of diagnostic tools such as ultrasonogram. [1] This disease may be presented as asymptomatic or with symptoms like upper right abdominal pain, jaundice. Usually asymptomic presentation was (17%-50%) in children. [2] Formation of gall stone in children was a very poorly understood phenomenon. In general, risk factors were child who was ill, were receiving hyperalimentation, were premature, having congenital anomalies and had necrotizing enterocolitis. Children aged (1-5) years most frequently had haemolysis as the underlying condition. [3] Although both genders were equally affected in early childhood, most previous studies had demonstrated female predominance in paediatric age group, starting from puberty. In fact, most cases of cholelithiasis at young age were diagnosed in the second decade of life. [4, 5] Removal of gall bladder by surgically is only solution for gall stone disease and therefore, the disease had a strong impact in children [6]. The present study had been undertaken to study clinical presentation, demographic status, etiology of gall stone in children and treatment plan.

Symptomatic cholelithiasis requiring surgery in children has increased in prevalence over the previous decade. The frequency of cholelithiasis in children is estimated to be 0.13 to 1.9%, and when compared to the adult population, where the risk of cholelithiasis is estimated to be 10- 15%, pediatric surgical centers' expertise is quite limited. [6] In 1991, three separate studies in the Journal of Pediatric Surgery showed that laparoscopic cholecystectomy is a safe and effective operation in children. [7] Prior to the advent of minimally invasive treatments, LC in children was performed very rarely. We present our experience with LC in youngsters, using the three-port approach.

Despite recent research indicating that cholelithiasis in children has increased over the last three decades, it is still a very uncommon condition in this demographic, with a prevalence of approximately 0.5%. In contrast to adults, the epidemiology of cholelithiasis in children is unknown, as most investigations involve a small number of patients. [8, 9] Aside from haemolysis as a risk factor for black-pigmented stones, the pathophysiology of stone formation in children is mostly unknown. [10] Furthermore, statistics on cholelithiasis in kids reveal a wide range of symptoms, and there is inconsistent evidence about management. The greater frequency with which cholelithiasis is identified with abdominal ultrasonography emphasizes the need for revised treatment guidelines.

Cholelithiasis or the formation of gallstones in children is a relatively rare but increasingly recognized condition. The growing prevalence can be attributed to factors such as rising rates of obesity, hemolytic disorders and the use of certain medications like ceftriaxone. Although many children with cholelithiasis are asymptomatic, others may present with symptoms similar to those in adults, including abdominal pain, nausea, and vomiting. Management of pediatric cholelithiasis depends on the severity of the condition, the presence of symptoms, and underlying risk factors. Asymptomatic cases often do not require immediate intervention and can be managed conservatively with regular monitoring. Symptomatic cases or those associated with complications like cholecystitis, pancreatitis, or choledocholithiasis may necessitate surgical intervention, typically via laparoscopic cholecystectomy, which is both safe and effective in children. Early detection and tailored treatment approaches are essential to prevent long-term complications. Preventative strategies, such as promoting healthy weight and addressing underlying metabolic or hematologic conditions, play a crucial role in managing the risk of cholelithiasis in children.

METHODOLOGY

This retrospective study was carried out in the Department of Paediatric Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU) during January 2008 to December 2012. A total of 31 paediatric patients were participated in the study. After hospital admission, patients were evaluated by detailed history, clical examination and relevant investigations. Detailed history, regarding abdominal symptom especially right upper quadrant (RUQ) pain with or without jaundice and nausea or vomiting with or without fever were sought. Hemolytic diseases of childs were recorded. Child, who was asymptomatic or incidentally diagnosed by Ultrasonogram (USG) were excluded in this study. Detailed general and relevant systemic examination of all patients were done. Baseline investigations like Complete blood count (CBC), Electrolyte, Liver function test (LFT), X- ray chest and blood group were performed of all patients. USG of hepatobilliary system was done for confirming gall stone. Haemolytic profile (peripheral blood film and Hb electrophoresis) was also done for excluding haemolytic disorders, as because thalasaemia (E beta) was more common in our country than other types of haemolytic diseases. No previous parenteral nutritional therapy, Prolonged fasting, ileal disease (like Crohn's) or resection of gut had been reported. Patients were treated by elective cholecystectomy by open method. After taking consent and matching eligibility criteria, data were collected from patients on variables of interest using the predesigned structured questionnaire by interview, observation. Statistical analyses of the results were be obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-22).

RESULTS

Table 1: Age Distribution of the Study Population (N=31)

Age range (Years)	No = 31	(%)
(1-5)	02	6.5
(6-10)	19	61.3
(11-16)	10	32.2

Table-1 shows age distribution of the study population, it was observed that, most (73%) of the cause of gall stone in children was idiopathic. Haemolytic causes were found in 7 (26.9%) patients.

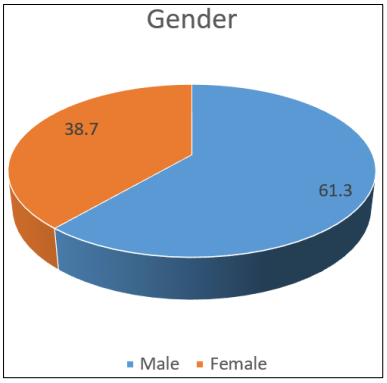

Figure 1: Sex Distribution of the Study Population (N=31)

Figure-1 shows sex distribution of the study population, it was observed that majority 19(61.3%) patients were male and 12(38.7%) were female.

Table 2: Distribution of the study population according to Etiology of Gall stone (N=31)

Etiology	No = 31	(%)
Ideopathic	19	73
Hemolytic	7	26.9

Among the 31 patients, 14 (45.2%) patients presented with RUQ pain, 9 (29.0%) patients had nausea or vomiting with or without fever, 5 (16.1%) patients had jaundice and 3 (9.7%) patients presented with RUQ with jaundice.

Table 3: Distribution of the Study Population According to Patients Grouping as Per Clinical Presentation (N=31)

Symptom	No = 31	(%)
RUQ pain		
Nausea/ Vomiting ± Fever	9	29.0
Jaundice	5	16.1
RUQ pain+ Jaundice	3	9.7

Table 3 show, the study population according to patients grouping as per clinical presentation. It observed that,

according to symptoms, Nausea/ Vomiting ± Fever was 9(29.0%), Jaundice was 5(16.1%), RUQ pain+ Jaundice was 3(9.7%) respectively.

Table 4: Associated Condition in Children with Gallstones (N-31)

Associated conditions	No = 31	(%)
Haemolytic diseases		
Sickle cell anaemia	6	19.35
Major thalassaemia	2	6.45
Congenital spherocytosis	2	6.45
Evans syndrome + IgA deficiency	1	3.22
Hepatobiliary diseases		
Progressive familial intrahepatic cholestasis type 2	5	16.12
Portal cavernoma	2	6.45
Congenital biliary duct malformation	2	6.45
Growth hormone deficiency	3	9.67
Down syndrome	2	6.45
IgA deficiency	2	6.45
Dehydration	2	6.45
Hypercalcaemia	1	3.22
No associated condition	1	3.22

Table 4 show, the associated condition in children with gallstones. It observed that, according to Haemolytic diseases, Sickle cell anaemia was 6(19.35%), Congenital spherocytosis was 2(6.45) and Evans syndrome + IgA deficiency was 1(3.22) respectfully. And Growth hormone deficiency, Down syndrome and Hypercalcaemia were 3(9.67), 2(6.45) and 1(3.22) respectively.

DISCUSSION

This retrospective study was carried out in the Department of Paediatric Surgery, Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka. During five years of study period, total 31 paediatric patients were included in this study. Cholelithiasis is a rare finding in children, even though recent series show increased detection of this disease.

Although cholelithiasis is considered a rare illness in children, recent research has shown an increase in this disorder. [11] This increase could be attributed to the growing usage of abdominal ultrasound scanning in childhood. The prevalence of paediatric gallstones was 0.13-0.22% in trials in which children were selected based on their early symptoms. [12] The age of diagnosis is related to the etiology; nonetheless, in most studies, the median age of diagnosis is between 5 and 10 years. [13]

Unlike in adults, cholelithiasis was relatively rare condition in paediatric age group.But in the last two decades, many countries had been observed an increase incidence of gall stone in children. [14] In our study, cholelithiasis more (61.3%) found in male child, which was similar to the study conducted in North Iran by Dooki MR and Norouzi. [15] But female prefominance found in most of the studies. [16-19] Age ranged of our study was (4-16) years and mean age was 9. 08± 2.98 years. Serdaroglu F and his colleagues. [17] showed in their study age ranged was (0.3-18) years and mean age 9.03± 5.29.

In our study 61.3% patients were belong (6-10) years, 32.2% patients were (11-16) years and 6.5% patients were (1-5) years ranged group. Ahmad R and his colleagues showed 42.1% were in age group (6-10) and 57.8% were in (11-14) years group, but no patients were in (1-5) years group in their study. [20] Most (73%) patients were idiopathic in our study, whereas Enayet A and his colleagues showed 28.3% patients were idiopathic. [21] Hemolytic cause of cholelithiasis in our study was 26.9%. Recent studied demonstrated in 21.6% and 11.8% of cases. [22, 23]

Common (45.2%) presentation findings in patients in this study was abdominal pain, which was almost similar to the study of Enayet A and his colleagues. [21] Ahmad R and his colleagues showed 89.4% patients had abdominal pain in their study. [20] In this study, Cholecystectomy was performed by open method in all patients were treated by open method, as because in our Institute no laparoscopic facility developed at that time. But Balaguer EJ and his colleagues showed the percentage undergoing cholecystectomy by a laparoscopic approach was 91%. [24]

Cholelithiasis in children is a rare disease with a prevalence between 0.13 and 0.22%. [25] The main risk factor for cholelithiasis is most likely obesity, and the increased incidence of childhood obesity is becoming alarming. Cholelithiasis is also detected more frequently than in previous years because of the increased use of ultrasound. Nowadays, we focus our attention not only on the rising number of diagnosed cases of infantile cholelithiasis and its operative treatment, but also on the type of cholelithiasis, its possible complications, and the incidence of obesity, specifically the elevation of body

mass index (BMI). In contrast to adults, it is more frequently non-symptomatizing in children. US is the gold standard for diagnosis. Chronic congenital haemolytic diseases remain the major predisposing factors because of the high rate of consanguinity. Laparoscopic cholecystectomy is the principal approach in the treatment of cholelithiasis not only in adults but also in children for less postoperative complications. We recommend that this approach be proposed in all chronic haemolytic cholelithiasis even if they were asymptomatic.

The increasing prevalence of cholelithiasis in children contributes to the growing interest in this disease. There were two limitations of this study. Firstly, the study was retrospective cross- sectional in design. Secondly, the hospital at which the study was conducted is a tertiary institution, this means the patients may be diagnosed and treated at their GP surgery or general hospital before they were referred to a tertiary centre. This reduced the number of patients reaching us and therefore our patient's sample may not represent the whole population.

Limitations of the study

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

CONCLUSION

The prevalence of cholelithiasis in children around the world has increased during the last three decades. Children are more likely to be symptom-free than adults. Cholelithiasis is becoming more widely recognized as a childhood condition. It is frequently associated with chronic hemolysis and hereditary hepatobiliary illness. Even though gallstones are rarely symptomatic, they must be removed in a majority of instances. Cholelithiasis in pediatric age group was relatively uncommon but can affect any age and sex. Idiopathic was the common cause and male predominance found in our study.

RECOMMENDATION

This study can serve as a pilot to much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

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The wide range of disciplines involved in cholelithiasis in children: 5 years single centre experience research means that editors need much assistance from references in the evaluation of papers submitted for publication. I would also like to be grateful to my colleagues and family who supported me and offered deep insight into the study.

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