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Epidemiology, risk factors, management of cholelithiasis in children and review of the literature

Epidemiologia, czynniki ryzyka i leczenie kamicy żółciowej u dzieci – przegląd piśmiennictwa

Ewa Matuszczak, Wojciech Dębek, Marzanna Oksiuta, Ewa Dzienis-Koronkiewicz, Adam Hermanowicz*

Medical University of Bialystok, Poland

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ABSTRACT

Aim of the study: Assessment of risk factors for cholelithiasis in pediatric population. **Methods:** A retrospective analysis of 143 patients with cholelithiasis treated during the period 2002–2012. **Results:** There was a significant female predilection for gallstones (73.4%). 70 (48.9%) children showed one or more risk factors for gallstones. 73 (51.1%) patients had no risk factors. Four groups of patients could be distinguished: 106 (74.3%) patients with colicky pain without jaundice, 10 patients with colicky pain with jaundice (7%), 16 (11.2%) children with pancreatitis, 8 (5.5%) with acute cholecystitis, and 3 patients with atypical symptoms (2%). According to therapy, patients could be divided in 3 groups: 130 children treated with laparoscopic cholecystectomy, 4 children treated with laparotomic cholecystectomy and 9 children treated with ursodeoxycholic acid. **Conclusions:** Laparoscopic cholecystectomy remains the golden standard in treatment for symptomatic cholelithiasis. Complications connected with laparoscopic cholecystectomy were noted in only 2% of patients in our series. Presence of relatives with cholelithiasis, obesity and hemolytic disorders were the predominant risk factors.

Gallbladder calculi are more common in the adult population, however, the incidence of cholelithiasis in children has increased. In a population-based study, prevalence of gallstones and biliary sludge in children was of 1.9% [1]. In study performed in adults, the prevalence of gallstones diseases was of 9.5% in men and 18.9% in women [2]. Little is known about natural history and management of cholelithiasis in childhood. The nature of cholelithiasis is different in children as compared to adults, with a higher proportion of pigment stones and less cholesterol-based stone disease, especially in children younger than 10 years [3].

* *Corresponding author at*: Medical University of Bialystok, Pediatric Surgery, Waszyngtona 17, 15-274 Bialystok, Poland. Tel.: +48 857450924; fax: +48 857450920.
E-mail address: ewamat@tlen.pl (E. Matuszczak).

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Methods

A retrospective study aimed to evaluate the management of children with cholelithiasis treated at Pediatric Surgery Department of Medical University of Bialystok, during the period 2002–2012 was performed. Medical charts revealed age, sex, clinical presentation of cholelithiasis, risk factors, basal liver and pancreatic function tests, ultrasonographic findings and way of treatment of children with gall stones. For statistical analysis we used *U* Mann–Whitney test and χ^2 test.

Results

During the 10-year period between 2002 and 2012, 143 children with gallstones were treated in Pediatric Surgery Department of Medical University of Bialystok responsible for the pediatric population of region, consisting of 300 000 children with the same ethnicity. The diagnosis of cholelithiasis was based on the presence of echogenic foci that produced acoustic shadowing in the gallbladder. Patients were aged 7–18 years (median age = 15 years 5 months). In our series there was statistically significant positive correlation between age of patients and occurrence of cholelithiasis. Among our patients with gallstones, so much as 73.4% were females ($n = 105$ girls). 70 (48.9%) children showed one or more risk factors for gallstones at personal and familial anamnesis. 73 (51.1%) patients had no risk factors and their cholelithiasis was defined as idiopathic. Presence of relatives with cholelithiasis, obesity, hemolytic disorders, and parenteral nutrition were the predominant risk factors. Presence of one or more relatives with cholelithiasis represented the most common risk factor, which was statistically significant ($n = 45$, 31.4% of our patients, $p < 0.05$). Among these patients, positive family history for cholelithiasis was described in maternal branch in 58% patients, in the paternal in 27% patients and in both branches in 15% patients. Obesity was the second most common risk factor, and was diagnosed in 38 (26.5%) of our patients. Spherocytosis was diagnosed in only 3% of our patients ($n = 4$). One patient developed gall stones due to parenteral nutrition, and one patient due the course of Ceftriaxone – those two patients benefited from the course of ursodeoxycholic acid. All patients treated in our Department were symptomatic. Duration of symptoms at diagnosis varied from one month to 12 months (mean 3.2 months). According to the symptoms four groups of patients could be distinguished: 106 (74.3%) patients with colicky pain without jaundice, 10 patients with colicky pain with jaundice (7%), 16 (11.2%) children with pancreatitis, 8 (5.5%) with acute cholecystitis, and 3 patients with atypical symptoms (2%). In 34 patients (23.7%) we observed elevation of total serum bilirubin level, also 34 (23.7%) patients had elevation of transaminases levels in the serum. 16 patients (11.2%) on the admission presented with elevation of serum amylase. According to therapy, patients could be divided in 3 groups: 130 children treated with laparoscopic cholecystectomy, 4 children treated with laparotomic cholecystectomy and 9 children successfully treated with ursodeoxycholic acid. Sixteen patients (11.2%) with common bile duct stones, and subsequent pancreatitis, were treated with Endoscopic Retrograde Cholangiopancreatography (ERCP) before planned laparoscopic cholecystectomy. Complications connected with laparoscopic cholecystectomy were noted in 3 patients (2%) only. One girl had post-operative bleeding from cystic artery – during re-laparoscopy artery was ligated. Two children had hepatic duct injury, which was the cause of conversion to conventional surgery and creation of choledochoenterostomy to Roux-en-Y jejunal limb. In our study the post-cholecystectomy syndrome – recurrence of clinical symptoms after treatment, was observed only in one patient. In not complicated cases, treated with planned laparoscopic cholecystectomy, the length of hospital stay was 2 days. The median length of hospitalization was 5.1 days (2–27 days) (Figs. 1–4).

Fifteen patients with radio-lucent gallstones were treated with ursodeoxycholic acid – UDCA (median dose 18 mg/kg per day) for 3–6 months (median 3.5 months). Only in 9 patients (6%) conservative treatment with UDCA proved to be successful with complete gallstones dissolution at ultrasound, and disappearance of clinical symptoms. Other six patients were treated with laparoscopic cholecystectomy.

In years 2002–2012 we observed statistically significant ($p < 0.05$) rise in number of patients treated in our department because of cholelithiasis (Fig. 5).

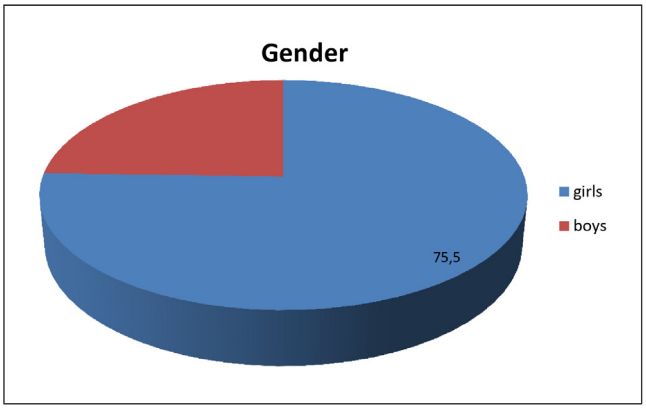

Fig. 1 – Gender of patients with cholelithiasis

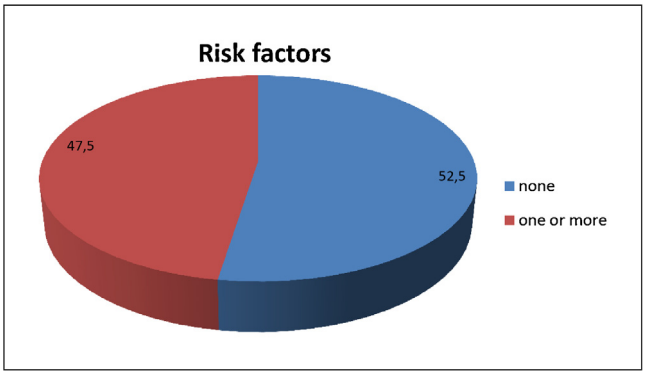

Fig. 2 – Risk factors for children with cholelithiasis