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Mini Review

Biliary dyskinesia. Increasing in Incidence or Better Recognition?

Kennedy A Sabharwal[1*], BA, Michael W Simon[2], MD, PhD
[1]University of Kentucky College of Medicine.
[2]University of Kentucky Department of Pediatrics, Lexington.

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***Corresponding author:** Kennedy Sabharwal, University of Kentucky College of Medicine 4040 Finn Way Suite 310, Lexington KY 40517.

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Abstract:

Gallbladder disease has historically remained uncommon in children. Children with nausea, abdominal pain and vomiting after eating are more likely to be diagnosed with irritable bowel syndrome. When children are evaluated with laboratory studies, ultrasound of gallbladder and HIDA scan, a diagnosis of biliary dyskinesia may be confirmed. Laparoscopic surgery of the gallbladder has been shown to be effective with minimal recovery and complications. Follow-up shows that children unlike adults generally remain symptom-free.

Key Words: biliary dyskinesia; laparoscopic cholecystectomy; gallstones; gallbladder

Introduction:

Throughout history, gallbladder disease has remained essentially nonexistent in pediatrics other than its association with hemolytic disease especially hereditary spherocytosis. Recently, the incidence of gallstones in the pediatric population has been on the rise, mostly due to the astounding increase in rates of pediatric obesity. (1,2) Other than childhood obesity, gallstones are also common in children who are given total parental nutrition due to short gut syndrome because of the decrease in gastric motility. It is much more common, however, that children with abdominal symptoms of nausea, vomiting and abdominal distress especially after eating have been considered to have other etiologies like irritable bowel syndrome and chronic nonspecific abdominal pain. (2) Gallbladder disease is often overlooked and ignored as a possible etiology, likely because there are no specific diagnostic criteria for children; however, the incidence of gallbladder disease is increasing in children (3).

Materials And Methods

Children presenting with sharp upper right quadrant abdominal pain, nausea and episodic vomiting after eating were evaluated. Their history was reviewed. If there was clinical suspicion and examination consistent with constipation, they had a flat plate of the abdomen performed. If the abdominal X ray was normal and they had a positive Murphy sign they had collected a comprehensive metabolic panel including gamma glutamyltransferase (GGT), complete blood count (CBC) with a manual differential and received an ultrasound of the abdomen. If the ultrasound showed gallstones, they were referred for surgical evaluation. If the ultrasound and laboratory studies were normal, they received a cholescintigraphy 99mTc hepatobiliary iminodiacetic acid (HIDA) scan with cholecystokinin (CCK) infusion. If the HIDA scan showed an ejection

fraction of less than 37% or infusion reproduced abdominal discomfort, they were sent for surgical evaluation. If the HIDA scan was normal they would be referred for gastroenterology evaluation.

Results

Since 2015, 33 children, 26 females (12 – 24 years of age, mean 14 years) and 7 males (12 – 20 years of age, mean 16 years), were identified with symptoms consistent with biliary dyskinesia followed by diagnostic confirmation of gallbladder disease. All laboratory studies were normal. One female was taking oral contraceptives. None of these children were obese. One child had stones visualized on ultrasound. None of the children had a thicken gallbladder wall visualized. The HIDA scan with infusion showed a reduced ejection fraction of less than 37% in 24 of the 26 females and all 7 males. The only child who did not have a HIDA scan was the subject with stones identified by ultrasound. For all the children symptoms were reproduced by dye infusion.

Discussion

The patients reported here had a history of sharp right upper abdominal pain, nausea, and occasional vomiting after eating. For all the children, examination was significant for a positive Murphy sign. These children were otherwise unremarkable for the examination with no fever or other findings. There was no antecedent history of illness. One female was on oral contraceptives. She was not the patient with gallstones.

Only one child had stones visualized on ultrasound. None of the children had a thicken gallbladder wall visualized. However, HIDA scan with contrast showed a reduced ejection fraction of less than 37% in 24 of the 26 females and all 7 of the males. The only child who did not have a HIDA scan was the subject with stones identified by ultrasound. For all the children symptoms were reproducible by the dye infusion. The HIDA scan is not predictive of underlying gallbladder histopathology, but it may signal dysfunction. A low ejection fraction during the HIDA scan or pain triggered by sincalide biliary infusion does not predict postoperative outcome. (4)

Symptoms of gallbladder disease in the pediatric population may present as acute abdominal pain, nausea, vomiting, and/or fatty-food intolerance. (5) The most common of these symptoms is vomiting seen in 60% of children who present with biliary dyskinesia. It is very rare to see a child with biliary dyskinesia presenting with only abdominal pain without vomiting. (6) For these individuals, symptoms had been present for three months up to two years prior to diagnosis. Selected dietary items like pizza and cheese seemed to exacerbate their symptoms, while dietary restrictions eliminating fatty meals improved their symptoms.

Within this data set, there was a gender predisposition for females to have biliary dyskinesia. A previous longitudinal study reported that teenage girls are four times more likely to have gallbladder disease compared to teenage boys. (7) Oral contraceptives may increase the risk of gallstones, but also the female gender as a whole may have an increased susceptibility to gallstones due to puberty and the production of estrogens. Estrogens increase the secretion of cholesterol into gallstones, which promotes the formation of gallstones. This could easily lead to increased frequency of cholelithiasis in teenage girls.

None of the children within this data were obese. Obesity has been identified as a significant cause of gallbladder disease in children. (8) This is likely due to bile saturation with cholesterol seen in obesity, excessive hepatic secretions, and impaired gallbladder motility. (9) Infection with Epstein-Barr virus, streptococci, Hepatitis A, and gram-negative infections may also cause gallbladder disease. (10-12)

Indication for surgery may be either symptom-based or chronic cholecystitis. Each child in the researcher's data had an outpatient laparoscopic cholecystectomy performed. Laparoscopic cholecystectomy has been shown to be a safe surgical approach in children without significant comorbidities. (13) However, the merits and benefits of cholecystectomy as a treatment option for biliary dyskinesia is still debated. Each child recovered uneventfully, and their symptoms abated after the surgery. They were seen at follow-up appointments between 1 month up to 3 years with no complications and no recurrent abdominal symptoms.

If a provider is suspicious of biliary dyskinesia in a pediatric patient, a positive Murphy's sign with consistent history may be an indication to begin evaluation with screening laboratory studies, ultrasound of the gallbladder and if all normal follow with a HIDA scan with infusion. The author's observation may reflect an increase in the occurrence of biliary dyskinesia in children or simply a better awareness and recognition of gallbladder disease.

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Conflicts of Interest: None

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