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The utility of nuclear medicine scans for diagnosing pediatric biliary dyskinesia remains unclear

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Biliary dyskinesia is a challenging concept for pediatric gastroenterologists. In this issue of JPGN, Jones, et al., mined a large database to shed additional light on the relationship between gallbladder (GB) ejection fraction and GB pathology in children who had undergone hepatic iminodiacetic acid (HIDA) scans. (1)

In their cohort, GB ejection fraction did not correlate with histologic findings of gallbladder pathology. For these authors, the lack of correlation increased their skepticism that HIDA scans are useful for diagnosing biliary dyskinesia in children and adolescents. Their data also support the idea that physicians depend on HIDA scans to make decisions about cholecystectomy.

But it is crucial to consider their findings in light of the HIDA scans and pediatric patients included versus excluded from the analysis. Considering the impact of their inclusion and exclusion criteria raises questions about whether the authors' conclusions are externally valid.

The analysis included a small subset of the HIDA scans done in children and adolescents during the study period –only those which led to cholecystectomy. It was remarkable that 70% of the subjects in this study actually had histologic cholecystitis according to their pathology reports. A smaller percentage had stones, but the authors do not note if this was in addition to or overlapping with those that had cholecystitis. If we think that chronic inflammation and/or stones contributes to these patients' symptoms, then this suggests that almost three out of four of the cholecystectomies were done on "appropriate" patients with pathologic findings in their excised GBs.

The histograms also suggest, as the authors note, that GB ejection fraction data was likely used to help decide about cholecystectomy. The figures show that approximately 50% of children with GB ejection fractions of 0–15% underwent cholecystectomy compared with approximately 10% in children with GB ejection fractions above 50%. Not surprisingly, providers who ordered HIDA scans to evaluate for biliary issues were more likely to recommend surgery if the imaging showed "abnormalities."

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It seems reasonable to assume that the gastroenterologists, surgeons or others were combining information on symptoms and GB ejection fraction to recommend cholecystectomy. If this is true, then children with low GB ejection fraction were probably more likely to undergo cholecystectomy with less “classic” or severe symptoms of biliary dyskinesia. The low GB ejection fraction cholecystectomy group might then have had lower-than-expected prevalence of cholecystitis and other histologic findings.

On the other hand, children with high GB ejection fraction that went to cholecystectomy probably had more classic or severe symptoms—thus leading them to surgery despite “normal” ejection fraction. The high GB ejection fraction group might then have a higher-than-expected prevalence of cholecystitis in their histologic specimens. If these assumptions hold, sampling bias would thus have decreased the observed prevalence of histologic findings in the low GB ejection fraction group and increased the observed prevalence of histologic findings in the high GB ejection fraction group—diminishing the differences observed between the two groups and leading to the authors’ finding that GB ejection fraction is not related to chronic cholecystitis in these children.

Additional research into the diagnosis and management of biliary dyskinesia is definitely needed. Because large, prospective, controlled studies on this condition in pediatrics are unlikely to be feasible, very careful interpretation of the available data is crucial for evidence-based guidance of our patients.

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