

Utility of Magnetic Resonance Enterography in Pediatric Inflammatory Bowel Disease

Inflammatory bowel disease (IBD) is increasing in incidence in the pediatric population, and magnetic resonance imaging (MRI) has become increasingly utilized in both adult and pediatric patients with IBD to assess extent of disease and to categorize severity. In pediatrics, MR enterography (MRE) has the advantage of allowing soft tissue visualization with no associated radiation. The authors of this study performed a meta-analysis of the literature to assess utility of MRE in the diagnosis of active inflammation in pediatric IBD in comparison to histopathology. This meta-analysis included specific studies for pediatric patients who underwent MRE for diagnosis of IBD, which had to include reference standards compared to histopathology findings, and had enough results that 2 x 2 tables could be made to determine efficacy of MRE in detecting inflammation in IBD. All other studies, such as case reports and conference abstracts were excluded. Data from these studies included study characteristics, number of patients, patient characteristics (sex, age), type of MRI equipment performing MRE, and MRE results in relation to clinical and histopathologic findings.

The authors initially found 550 potential articles for inclusion; however, only 18 articles (containing 687 patients) met inclusion criteria. Half of the studies were prospective; half were retrospective. Ten studies exclusively evaluated pediatric patients with Crohn disease while the remainder evaluated patients with IBD in general. MRI capability consisted of 1.5-T in 12 studies, 3.0-T in 2 studies, either type of scanner in 2 studies, and not clearly defined in 2 studies. For the totality of all studies, summary sensitivity was 83% (95% CI, 75%-89%) and summary specificity was 93% (95% CI, 90%-95%). However, a Higgins I² statistic showed some degree of heterogeneity in both sensitivity (84.1%) and specificity (68.8%) for all studies. A subsequent meta-regression analysis of covariates

demonstrated that only scanner manufacturer type was associated with significant study heterogeneity.

This study demonstrates that MRE has both good sensitivity and specificity in detecting active inflammation in pediatric patients with IBD. Thus, this study modality can be used to assess disease extent and activity (especially in areas beyond the range of standard endoscopy) in this patient population with the benefit of no associated risk of ionizing radiation. The authors of this study do comment that half of the included studies were retrospective which lends to selection bias. Regardless, this study demonstrates the effectiveness of MRE in the diagnosis and treatment of pediatric IBD.

Yoon H, Suh C, Kim J, Lee J, Jung A, Kim K, Cho Y. Diagnostic performance of magnetic resonance enterography for detection of active inflammation in children and adolescents with inflammatory bowel disease: a systematic review and diagnostic meta-analysis. *JAMA Pediatrics* 2017; 171: 1208-1216.

Astrovirus Infections in Children: An International Perspective

Astrovirus is an RNA virus associated with typically acute and self-limiting diarrhea; however, the epidemiology of this infection in geographic areas with higher levels of pediatric undernutrition is poorly understood. In order to characterize this infection in this specific group, a consortium group called The Etiology, Risk Factors, and Interactions of Enteric Infection and Malnutrition and the Consequences for Child Health and Development (MAL-ED) Study evaluated children from the following 8 countries: Bangladesh, India, Nepal, Pakistan, Brazil, Peru, Tanzania, and South Africa. Infants were enrolled in this study by 17 days of age and subsequently were followed for the next 2 years. Stool samples were obtained monthly in the first year of life and then were obtained quarterly until study completion. Breastfeeding history as well as history of any type of infection were recorded. Additional stool samples were obtained whenever study subjects had diarrhea. All stool samples underwent analysis by an

enzyme-linked immunosorbent assay and other testing methods to evaluate for astrovirus as well as other enteropathogenic infections.

In total, 2082 children (1036 boys) were enrolled which included 7077 diarrhea stool samples and 25,868 surveillance samples. There were 2.1 astrovirus infections per 100 child-months across all countries with the peak infection time between 6 to 11 months of age. Astrovirus was more commonly isolated in diarrhea stools (5.6%) compared to surveillance stools (2.2%) with the prevalence of astrovirus in diarrhea samples increasing and then peaking between 12 to 14 months of age. Most astrovirus-positive stools that were associated with diarrhea (77%) had at least one coinfection with the most common infection being *Campylobacter* species. Immunity to astrovirus infection was calculated by comparing astrovirus infections and diarrhea between study subjects with or without a prior infection, and although a reduced incidence of infections was noted in children with a prior astrovirus infection, the reduction was not statistically significant. Interestingly, the odds of infection were significantly reduced in children with increased length-for-age Z scores (used to assess “growth faltering”).

This study demonstrates that astrovirus is a common cause of diarrhea in developing countries and is at a higher risk of occurring in children with undernutrition. The authors point out that other causes of infectious diarrhea are receiving research funding, and the large disease burden associated with astrovirus suggests the need for more funding, especially in terms of treatment options, such as vaccination.

Olortegui M, Rouhani S, Yori P, Salas M, Trigo D, Mondal D, Bodhidatta L, Platts-Mills J, Samie A, Kabir F, Lima A, Babji S, Shrestha S, Mason C, Kalam A, Bessong P, Ahmed T, Mduma E, Bhutta Z, Lima I, Randass R, Moulton L, Lang D, George A, Zaidi A, Kang G, Houpt E, Kosek M (and the MAL-ED Network). Astrovirus infection and diarrhea in 8 countries. *Pediatrics* 2018; 141: e20171326.

John Pohl, M.D., Book Editor, is on the Editorial Board of *Practical Gastroenterology*

PRACTICAL GASTROENTEROLOGY

REPRINTS

Special rates are available for quantities of 100 or more.

For further details
visit our website:

practicalgastro.com

*Celebrating
42 Years
of Service*