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### **Abstract**

Title: Prevalence of Hepatic Steatosis in a Pediatric Inflammatory Bowel Disease Population

#### Background:

Non-alcoholic fatty liver disease (NAFLD), considered the most common liver disorder in Western society, ranges in severity from benign hepatic steatosis, or “fatty liver”, to non-alcoholic steatohepatitis (NASH), an inflammatory state that may eventually lead to cirrhosis or hepatocellular carcinoma.<sup>1</sup> There is increasing concern regarding that subjects with inflammatory bowel disease (IBD) may be at higher risk for NAFLD/NASH due to use of medications (like steroids and/or methotrexate), as well as increased inflammatory cytokines, and potential hepatobiliary extraintestinal manifestations.<sup>2</sup> Studies have estimated the prevalence of NAFLD to be 8.2-41% in adult IBD populations based on various abdominal imaging modalities.<sup>3,4</sup> Not surprisingly, known risk factors for NAFLD such as obesity and hypertension were found to be associated with NAFLD in patients with IBD.

Unfortunately NAFLD/NASH is not limited to adults, and there is a serious and rising obesity epidemic occurring in children. At this time, no previous studies have estimated the prevalence of NAFLD in pediatric IBD patients. Such a study would have meaningful implications in the treatment and screening for this disease in children with IBD.

#### Objective:

The main objective of the study is to determine the prevalence of hepatic steatosis in a population of pediatric inflammatory bowel disease (IBD) patients at the University of Rochester Medical Center in Rochester, NY. Furthermore, we aim to elucidate potential associated risk factors (e.g. increased BMI, duration of disease, medication usage, etc.) for fatty liver in pediatric IBD patients.

#### Results:

Among a total of 353 patients diagnosed with IBD and treated by the URMC Division of Pediatric Gastroenterology and Nutrition between June 2012 and May 2017, 241 patients between 6-18 years old were identified to meet the study criteria. 9 of these patients were noted upon imaging (ie. ultrasound, CT, MRI) to have fatty infiltration of the liver. This given prevalence of 3.73% (95% CI: 1.34%, 6.12%) was not significantly different compared to that of age-matched controls without IBD (6.22%; 95% CI: 3.17%, 9.27%; Z= 0.396, p=0.346). Among these 9 patients, 66.7% were diagnosed with Crohn's disease, while the remaining 33.3% had ulcerative colitis. No significant associations of age, disease duration, or past use of medications (ie. corticosteroids, biologics, immunomodulators, and 5-acetylsalicylates) were found between IBD patients presenting with steatosis and those that did not. Notably, patients with both fatty liver and IBD had a significantly higher mean higher body mass index than those with only IBD (p=0.00373).

#### Conclusion:

As the management of IBD has improved over recent years, the phenotype of malnourished, underweight pediatric patients with IBD is no longer universally applicable. Children and adolescents with IBD face the same risk of fatty liver as the general population given increasing BMIs.

References:

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3. Sourianarayanan A, Garg G, Smith TH, Butt MI, McCullough AJ, Shen B. Risk factors of non-alcoholic fatty liver disease in patients with inflammatory bowel disease. *Journal of Crohn's and Colitis.* 2013; 7: 279-285.
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