CASE REPORT

Cryptosporidium diagnosed on endoscopic biopsy in a paediatric patient with inflammatory bowel disease

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SUMMARY

Cryptosporidium, a parasitic infection commonly associated with diarrhoea, may be difficult to differentiate from a flare in patients with inflammatory bowel disease and can lead to unnecessary therapy and increase in morbidity and mortality. We report the case of a paediatric patient who had substantial stool output requiring significant fluid resuscitation and who was later diagnosed with cryptosporidium on endoscopic biopsy. Diagnostic work up for cryptosporidium should be strongly considered when a patient presents with a flare involving massive stool output.

BACKGROUND

Cryptosporidium is a parasite and one of the most common causes of waterborne diseases in the USA. Cases can occur with outbreaks or sporadically. It is usually self-limiting, but in immunocompromised patients, such as inflammatory bowel disease (IBD) patients on biologicals, there may be significant morbidity and mortality associated with it, and in some patients may even be difficult to differentiate cryptosporidium from an IBD flare, which can lead to unnecessary therapy.

CASE PRESENTATION

We report the case of a 6-year-old boy with ulcerative colitis maintained on combination therapy with a biological (infliximab) and methotrexate who presented with a 1 day history of vomiting, cramping abdominal pain and watery bloody stools significantly more than baseline (>20 stools/24 hours). He

Figure 1 H&E stain: round to oval shaped parasites (arrows) on the enterocytes' luminal surface of the caecum.

Figure 2 Trichrome stain: round to oval shaped parasites (arrows) on the enterocytes' luminal surface of the caecum.

was afebrile and had no sick contacts or recent travel. His last infliximab dose was given 3 days prior to presentation. His Pediatric Ulcerative Colitis Activity Index (PUCAI) score, a validated scoring system for disease activity, was 40/85 prior to this presentation putting him at moderate disease activity.

INVESTIGATIONS

On admission, labs showed a slightly elevated C reactive protein and erythrocyte sedimentation rate of 2.7 (<1 mg/dL) and 20 (<10 mm/hour), respectively, and white cell count of 9.7 (6–15×10³/μL) with 15% bandemia. Stool gram stain showed few white cell count and few yeast. Stool *Campylobacter* antigen, rotavirus, *Clostridium difficile*, *Shigella*, *Salmonella* and viral and bacterial cultures were negative. Stool calprotectin, a marker of gut inflammation, was >2000 (≤162.9 μg/g).

OUTCOME AND FOLLOW-UP

He required fluids up to 1.7× maintenance in order to maintain his hydration status. His PUCAI score on admission increased to 65/85, and thus on day 5, after infectious evaluation was unrevealing, he was started on steroids in order to help induce remission for a possible flare. Given severity of his symptoms, he had an upper and lower endoscopy on day 6. His colonoscopy showed friable erythematous mucosa with sloughing throughout the colon with increasing severity with caudal progression from mild to severe. On biopsy, round to oval shaped parasites were seen on the enterocytes' luminal surface of the caecum in keeping with cryptosporidium on the H&E stain (figure 1) and trichrome (figure 2). By day 14, his

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symptoms had improved, and he was having 5–6 loose but less watery stools, but given his immunocompromised state, when results of the biopsy finding of cryptosporidium were available, he received a 3-day course of nitazoxanide 200 mg twice daily and was subsequently discharged on day 17. No significant change in stooling was noted in the immediate days after starting nitazoxanide prior to discharge.

DISCUSSION

Cryptosporidium has not been well studied in the setting of IBD, and data are limited. Patients with IBD who receive steroids or biologicals are at increased risk for such parasitic infection. To our knowledge, there is only one study to date that assessed cryptosporidium in children with IBD. That study assessed 149 flares over 6 years and found seven affected patients with a rate of 4.6%. Five of those seven patients required hospitalisation due to severe dehydration requiring fluid resuscitation. This study found that patients with cryptosporidium had better outcomes with no significant impact on IBD course compared with patients with true disease relapse who needed escalation of therapy and rehospitalisation.¹ Outside of a handful of case

reports in the adult literature, most of our experience with IBD and cryptosporidium came from the 2003 Milwaukee Cryptosporidium outbreak in which 12 patients presented with acute relapse of IBD secondary to cryptosporidium.² They reported resolution of symptoms within 2 months, immunosuppressive therapy not affecting duration of symptoms and antibiotics not clearly reducing duration. It is difficult to clinically differentiate a true disease flare from cryptosporidium, but identifying cryptosporidium early in the course may prevent steroid use and potentially escalation of therapy. Cryptosporidium can be easily missed in routine ova and parasite (O&P) exams, as routine O&P with modified acid-fast staining has a sensitivity of just over 50%, whereas enzyme immunoassay (EIA) and direct fluorescent antibody (DFA) based methods have sensitivity and specificity of >90%.³ More data are needed to determine if cryptosporidium should be screened with all IBD flares, but we propose that testing via EIA/DFA should be strongly considered when a patient's flare involves massive stool output or during an outbreak in which the patient may have been exposed.

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Learning points

- ▶ Cryptosporidium in paediatric patients with inflammatory bowel disease may be difficult to differentiate clinically from a true disease flare.
- ▶ Clinicians should consider screening for cryptosporidium in paediatric patients with inflammatory bowel disease who present with massive stool output.
- ▶ Enzyme immunoassay and direct fluorescent antibody based testing have superior diagnostic sensitivity to routine ova and parasite exams for evaluating cryptosporidium.
- ▶ Identifying cryptosporidium early in disease course may prevent steroid use and escalation of therapy in paediatric patients with inflammatory bowel disease.

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