

A Case Report from Somalia: Multispecies Intestinal Parasitism and *Helicobacter pylori* Coinfection in a Child from a Displacement Camp

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Abstract: Intestinal parasitic infections and *Helicobacter pylori* are prevalent in low-resource settings, especially in overcrowded areas with poor sanitation and limited healthcare access. These conditions are notably pronounced in internally displaced people (IDP) camps nationwide. Children in such environments are at increased risk of multiple coinfections due to environmental exposures and inadequate preventive measures. Endemic parasites such as *Ascaris lumbricoides*, *Trichuris trichiura*, *Strongyloides stercoralis*, *Hymenolepis nana*, and *Entamoeba* spp. are commonly found alongside chronic bacterial infections like *Helicobacter pylori*, which are associated with gastritis, peptic ulcers, and nutritional deficiencies. The shared transmission routes and risk factors of these pathogens exacerbate the disease burden, particularly in malnourished children, leading to adverse health outcomes. This report describes a six-year-old Somali girl from an IDP camp in Mogadishu who presented with chronic gastrointestinal symptoms and was diagnosed with severe polyparasitism and active *H. pylori* infection based on laboratory investigations. She was successfully treated with a tailored multidrug regimen targeting both helminths and bacteria, resulting in clinical and parasitological recovery. The case highlights the urgent need for integrated diagnostic, therapeutic, and educational interventions in humanitarian settings. Addressing these coinfections through comprehensive strategies is crucial not only for improving individual health but also for alleviating the broader public health burden in displaced and resource-limited communities.

Keywords: intestinal parasites, *Helicobacter pylori*, coinfection, malnutrition, internally displaced persons, Somalia

Introduction

Intestinal parasites and *Helicobacter pylori* (*H. pylori*) are common infectious agents, especially in resource-limited settings like Somalia. Their prevalence is particularly high in environments with inadequate sanitation, limited access to clean water, poor hygiene practices, and overcrowded living conditions—factors frequently encountered in internally displaced persons (IDP) camps.¹

Globally, it is estimated that over 3.5 billion people are affected by intestinal parasitism, which includes soil-transmitted helminths, such as *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworms, as well as protozoan species, such as *Giardia lamblia* and *Entamoeba* spp.² The burden of intestinal parasitic infections is disproportionately higher in developing regions, where many of these pathogens remain endemic.^{3,4} *H. pylori* is a Gram-negative bacterium associated with chronic gastritis, peptic ulcer disease, and gastric malignancies. An estimated 50% of the global population is affected by this bacterium, with prevalence rates reaching up to 70% in low-income settings, where poor sanitation and overcrowding are common.⁵ In Somalia, recent hospital-based data indicate that *H. pylori* affects 44.8% of

symptomatic adults attending outpatient clinics at the Somali Sudanese Specialized Hospital between 2022 and 2023.⁶ Coinfections involving *H. pylori* and intestinal parasites are clinically significant, as they tend to exacerbate gastrointestinal symptoms and may lead to more severe disease outcomes, especially among vulnerable populations such as children. One contributing factor is *H. pylori* ability to modify the gastric environment to promote parasite colonization and survival. Notably, both types of infections share common transmission routes linked to environmental and socio-economic determinants that are frequently observed in displaced populations.^{2,7} Populations living in crowded and underserved settings, such as refugee or IDP camps, are at particularly high risk for such coinfections because of increased exposure and minimal access to preventive and curative healthcare services.^{3,8} This case report presents a six-year-old girl from an IDP camp in Mogadishu with concurrent infection with five intestinal parasites and *H. pylori*, highlighting the significant public health burden of gastrointestinal coinfections in Somalia. This underscores the pressing need for integrated health interventions that target both parasitic and bacterial infections to improve child health outcomes in humanitarian settings.

Case Presentation and Management

During a free medical outreach at an internally displaced persons (IDP) camp in the Deynile district, we encountered the mother of a six-year-old Somali girl who described her daughter's prolonged and distressing health issues. The child had been suffering from persistent abdominal pain, recurrent fever, nausea, diarrhea, poor appetite, general weakness, blood-stained stools, and occasional episodes of confusion. According to the mother, these symptoms had persisted for nearly two years. When asked about the child's personal hygiene habits, including handwashing before meals and after using the toilet, the mother responded that these practices were only followed occasionally. Our observations of their living conditions revealed that the family shared a public latrine with other camp residents, and many children, including the patient, frequently practiced open defecation because of limited access to clean and private sanitation facilities. Considering the chronic nature and severity of the symptoms, we provided the child with a stool sample container for comprehensive laboratory analysis. Once the sample was collected, we performed a wet mount examination at a university laboratory using an Olympus CX22 microscope (Olympus Corporation, Tokyo, Japan). The analysis revealed the presence of five distinct intestinal parasites: *Ascaris lumbricoides* (roundworm), *Trichuris trichiura* (whipworm), *Hymenolepis nana* (dwarf tapeworm) eggs, and *Strongyloides stercoralis* larvae. Motile bacilli were also noted, suggesting a concurrent bacterial infection in the intestinal tract (Figure 1).

Given these findings, we proceeded to test for *H. pylori*, a bacterium known to cause chronic gastrointestinal symptoms, such as stomach pain, nausea, and reduced appetite. A stool antigen test was performed, which confirmed an active *H. pylori* infection by detecting antigens in the fecal sample. To ensure a more thorough clinical assessment and management plan, we arranged a free consultation with a pediatrician for the family. The child underwent a series of additional diagnostic tests, including Complete Blood Count (CBC), Liver Function Tests (LFT), Renal Function Tests (RFT), and abdominal ultrasound. These investigations helped evaluate the child's overall health status and the impact of the infection. The pediatrician prescribed a comprehensive treatment. This included Nexium powder, administered once daily for two weeks, and Flagyl syrup at 7 mL three times daily for two weeks. Amoxiclav syrup was also prescribed at a dosage of 400 mg twice daily for two weeks. To target the intestinal helminths, Antiver syrup (Mebendazole 100 mg/5 mL) was administered at 5 mL twice daily for three days, with the same dosage repeated after a two-week interval. Praziquantel was administered as a 600 mg tablet with a single half-tablet dose. Supportive therapy included folic acid tablets at 5 mg once daily for one month and Ferrasenol syrup at 5 mL once daily for one month to address potential micronutrient deficiencies and anemia. The patient showed a complete recovery after one month of the initiation of the medical treatment.

Discussion

The presented case highlights the significant clinical and public health challenges associated with multiple concurrent parasitic and bacterial infections, emphasizing their compounded impact on patient health. The child's prolonged symptoms, including persistent abdominal pain, fever, diarrhea, and occasional confusion, reflect the severe implications of polyparasitism and concurrent *H. pylori* infection.⁹ These coinfections exacerbate gastrointestinal morbidity,

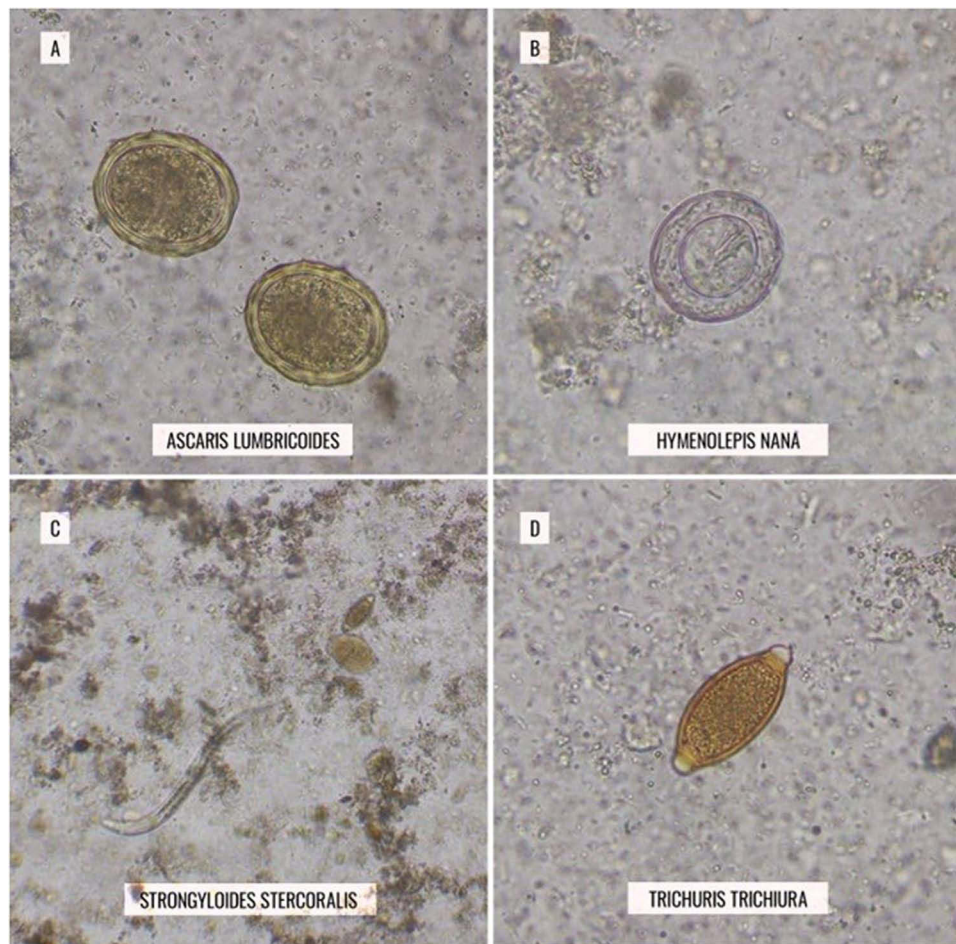


Figure 1 Microscopic findings from the stool sample of the six-year-old patient. (A) A round, thick-shelled egg consistent with *Ascaris lumbricoides*. (B) Ova of *Hymenolepis nana*, displaying their characteristic oval shape with internal polar filaments; (C) Low-power field showing multiple parasitic elements, including a larva of *Strongyloides stercoralis* (D) A typical barrel-shaped egg of *Trichuris trichiura* with distinct polar plugs.

potentially leading to chronic malnutrition, anemia, and impaired cognitive and physical development in children, particularly in resource-limited settings.^{10–12} Despite being highly manageable and preventable, helminthiasis continues to be a significant problem in Somalia and similar low-resource regions.¹³ This persistence is attributed to several intertwined factors, including poor sanitation, limited hygiene practices, overcrowding, and inadequate access to healthcare services.^{14,15} In this case, the family's use of shared sanitation facilities and children's frequent engagement in open defecation practices notably increased the risk of exposure, sustaining the infection cycle despite previous treatment efforts.^{16,17} Furthermore, the intermittent nature of hygiene practices reported by the mother underscores the necessity of community-level education to reinforce consistent hygiene behaviors.¹⁸

Previous treatments with medications such as Albendazole and Metronidazole provided only transient relief, indicating possible suboptimal drug adherence, incomplete eradication of parasites, or rapid reinfection due to persistent environmental contamination. Although we did not obtain detailed information about the previous healthcare facilities visited by the family, understanding these dynamics would have helped identify systemic shortcomings in healthcare delivery and reinforced targeted interventions to minimize recurrence. During our interaction, we implemented comprehensive education and awareness initiatives directed towards the child's parents, emphasizing the importance of hand hygiene, proper sanitation practices, and the critical nature of consistent medical follow-up.^{19,20} Educational interventions are proven strategies for significantly reducing reinfection rates and improving overall community health outcomes in similar contexts.^{21,22}

The extensive drug regimen administered to the child, comprising Nexium, Flagyl, amoxiclav, Mebendazole, Praziquantel, Folic Acid, and Ferrasenol, was necessitated by the complexity and severity of her multiple infections.^{23,24} Each medication targeted specific pathogens identified during diagnostic evaluations, thus comprehensively addressing helminthic and bacterial infections. While polypharmacy poses risks such as potential adverse effects, drug interactions, and compliance issues, the severity and multiplicity of infections justify this robust therapeutic approach, with vigilant clinical monitoring to mitigate adverse outcomes.^{25,26} Although the Somali government has initiated routine mass drug administration (MDA) programs targeting soil-transmitted helminths and schistosomiasis, the sustainability and effectiveness of these initiatives have been hindered by resource constraints, irregular program implementation, and logistical challenges, particularly in internally displaced populations.^{27,28} Consequently, despite intermittent mass treatment campaigns, environmental and behavioral factors continue to facilitate parasite transmission, perpetuating public health challenges.

It is also important to recognize that coinfection of intestinal parasites and *H. pylori* is widely recognized as a common health issue in resource-limited settings. This case report underscores the severity of such coinfections, as confirmed by the microscopic examination of the stool sample revealing multispecies parasitism alongside active *H. pylori* infection. Despite the history of previous medication use, clear data on treatment adherence or prior eradication efforts was limited, highlighting the challenge of managing recurrent infections. Given that the child had been experiencing symptoms for nearly two years, there is a pressing need to strengthen capacity at primary healthcare levels to facilitate timely diagnosis and intervention. Rapid assessment and treatment initiation could significantly reduce disease burden and prevent long-term complications. Furthermore, the administration of multidrug regimens, as employed in this case, must be approached with caution; it is essential to differentiate cases where broad-spectrum therapy is justified from situations where targeted therapy might be preferable. Considerations such as potential drug interactions, patient-specific health issues, and the risk of adverse effects should be carefully evaluated to prevent medication-related complications. Developing simplified, evidence-based treatment protocols suitable for primary care providers could improve management outcomes and avoid unnecessary polypharmacy, especially in high-burden settings where healthcare resources are limited.

Comparable international reports corroborate the adverse effects of multiple parasitic infections in pediatric populations in low-resource settings.^{29,30} Similar studies from Ethiopia and other regions in sub-Saharan Africa highlight the comparable challenges of polyparasitism, compounded by socioeconomic factors, inadequate sanitation, and limited health literacy, reiterating the importance of integrated, sustainable healthcare interventions.^{1,9,31} Upon completing the prescribed treatment regimen, follow-up evaluations demonstrated marked clinical improvement in the child's symptoms, signifying effective disease management. Recovery was ascertained through repeated clinical assessments and negative follow-up stool examinations for parasites and *Helicobacter pylori* antigens. This outcome highlights the effectiveness of a comprehensive therapeutic and educational approach, highlighting the necessity of sustained public health interventions to prevent recurrence and effectively manage persistent risk factors.

Conclusion

This case highlights the profound health impact of multispecies intestinal parasitism and *H. pylori* coinfection in a resource-limited setting, compounded by factors such as poverty, inadequate sanitation, and limited parental awareness. The child's persistent and severe gastrointestinal symptoms underscore the urgent need for comprehensive diagnostic and therapeutic approaches tailored to vulnerable children facing similar challenges. Addressing such complex infections requires not only effective medical treatment but also targeted education on hygiene practices within the specific context of displaced populations. This case emphasizes the importance of individualized management strategies and highlights how socioeconomic and environmental factors can complicate clinical outcomes, reinforcing the necessity for context-specific interventions to improve health and prevent recurrence in similar high-risk groups.

Data Sharing Statement

The data supporting the findings of this study are included in the paper.

Ethical Approval and Consent to Participate

Institutional approval was not required for publication of this case report. Written informed consent was obtained from the mother of the patient for the publication of this case report and any accompanying images. The mother was informed of the purpose of this publication, and consent included permission to share details of the case anonymously for educational and research purposes.

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Disclosure

The authors declare no conflict of interest.

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