



Case report

Corticosteroids in Covid-19 pandemic have the potential to unearth hidden burden of strongyloidiasis



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ABSTRACT

COVID-19 pandemic has posed formidable public health and clinical challenges to the entire humanity. A significant proportion of the COVID-19 patients have been provided immunosuppressive agents, particularly corticosteroids, as a part of management of moderate to severe COVID-19 disease. This has the drawback of development of strongyloides hyperinfection to disseminated infection in latent strongyloides infection patients. We are reporting the case of strongyloidiasis hyperinfection in a COVID-19 patient from a developing country, who initially received corticosteroid therapy for management of COVID-19, but later presented to hospital with non-specific, strongyloides related symptoms.

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Introduction

Strongyloidiasis, a parasitic disease caused by intestinal nematode *Strongyloides stercoralis* [1]. Serosurveys based on specific IgG estimation suggest that 10%–40% of populations in tropical and subtropical regions may be infected with *S. stercoralis* [2,3]. Largely the burden of strongyloidiasis remains hidden, due to its non-specific manifestations. Although a majority of individuals with strongyloidiasis are asymptomatic, moderate to severe manifestation in the form of hyperinfection syndrome & disseminated strongyloidiasis may occur [4]. These are usually associated with use of an immunosuppressive drug in persons with unrecognized chronic infection. The most common precipitator is use of corticosteroid agents which induce immunosuppression, which appears to be independent of dose or duration of treatment [5–7]. Also, there is evidence suggesting that, corticosteroids can play a role as molting signals for eggs, which enhances parasite production and promotes dissemination. [8,9] A study that reviewed 133 individuals with strongyloides hyperinfection found that hyperinfection was associated with corticosteroid administration in 83 % of cases, with an average dose of 40 mg per day of prednisolone [10]. In addition, cases have occurred within 5 days of administration of the first dose of corticosteroids, following doses as low as 20 mg of prednisone and following a single dose of

dexamethasone, leading experts to assert that the occurrence is independent of dose, duration, or route of administration [5].

The vague clinical presentation of strongyloidiasis delays clinical suspicion leading to hyperinfection and disseminated strongyloidiasis. Therefore, persistent and vague gastrointestinal, cutaneous or pulmonary symptoms along with underlying predisposing conditions and prolonged duration of illness should arouse suspicion for this parasitic infection [11]. However, a stool microscopy demonstrating larva has less sensitivity. But the sensitivity increases upto 70%, if three stool specimens are screened [12].

We diagnosed this case of strongyloidiasis hyperinfection after clinical suspicion and a prompt stool routine microscopy examination, which revealed rhabditiform larva of *S. stercoralis*. We report only the second case of strongyloidiasis after receiving corticosteroid treatment for COVID-19, in the world & first from a developing country. Our patient did not develop disseminated strongyloidiasis syndrome. Objective of our case report signifies importance of early detection and initiation of prompt treatment which prevent disease form being disseminated.

Case

A 53-year-old male patient, from Central India, presented with chief complaints of fever & diarrhea since 4 days & abdominal discomfort after meals, since one-and-a-half month. Two months back, patient was admitted in our hospital due to COVID-19 when he received intravenous Methylprednisolone 60 mg twice a day for 5 days, in view of disease severity at the time of admission. After 2

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Fig. 1. Adult female worm in Koga agar culture plate (magnification 100X).

weeks, patient was discharged in stable condition after testing negative for SARS-CoV-2 by RT-PCR.

Patient was admitted and underwent upper gastro-intestinal endoscopy which revealed hiatus hernia with duodenal ulcer. Blood parameters were notable for normocytic normochromic anaemia, neutrophilic leukocytosis (TLC: 26,380/mL³, neutrophils 82 % with left shift and normal eosinophil count). Blood cultures were sterile, and faecal occult blood test was positive. HRCT chest revealed moderate pleural effusion, interlobular septal thickening with linear fibrotic bands in bilateral lung parenchyma. Repeat RT-PCR test for SARS-CoV-2 was negative at this point of time.

Stool microscopic examination, done in view of loose stools and anaemia, revealed rhabditiform larvae of *Strongyloides stercoralis*, which were 280–300 µm long with short buccal cavity, prominent genital precordium and pointed tail. The stool sample was also inoculated on Koga agar plate and within 48 hours, actively motile filariform larvae and adult female worms of *S. stercoralis* were observed (Fig. 1). A diagnosis of Strongyloidiasis hyperinfection syndrome with hiatus hernia and duodenal ulcer was established. Patient was treated with injection amoxicillin, injection clarithromycin, injection pantoprazole along with oral albendazole and ivermectin. After 2 weeks, microscopic examination of stool & inoculation on Koga agar plate didn't demonstrated any parasitic forms of *S. stercoralis*.

Systemic corticosteroids are recommended for patients with severe and critical COVID-19, due to their anti-inflammatory action. However, their use is associated with increased risk of variety of infections including Strongyloidiasis. The global burden of Strongyloidiasis is grossly underestimated, with a large population in low-to-middle income countries (LMICs) at risk. Majority of those infected, harbor the parasite asymptotically and corticosteroid treatment can progress it to hyperinfection syndrome or even potentially fatal, disseminated form. This case serves a timely reminder to a busy clinical community about infectious complications of corticosteroid treatment, particularly after recovery from COVID-19. We suggest risk assessment for Strongyloidiasis should be done in all cases of COVID-19 requiring corticosteroid therapy in LMICs and high-risk patients should be followed to prevent morbidity associated with Strongyloidiasis.

Consent

A written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of

the written consent is available for review by the Editor-in-Chief of this journal on request.

Author's contributions

All authors were involved in either clinical or diagnostic care of the patient. Disha Gautam, Adarsh Meher & Farha Siddiqui wrote the initial draft of the manuscript, Ayush Gupta & Abhishek Singhai revised the initial manuscript. All authors approve the final version.

CRedit authorship contribution statement

Disha Gautam: Writing Original Draft, Data Curation, Methodology, Visualization. **Ayush Gupta:** Conceptualization, Editing of Final Manuscript, Supervision. **Adarsh Meher:** Writing Original Draft, Methodology, Visualization. **Farha Siddiqui:** Writing Original draft, Methodology, Visualization. **Abhishek Singhai:** Editing of Final Manuscript, Clinical Workup, Visualization.

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