



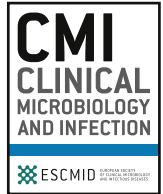
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Picture of a microorganism

Sarcoidosis, steroids and *Strongyloides*—what's the catch?A. Kumar^{1,*}, R. Paulose², S. Sadasivan³, C. Bajad², A. Ramachandran¹, P. Nair³¹ Department of Microbiology, Amrita Institute of Medical Sciences & Research Centre, Amrita Vishwa Vidyapeetham, Ponekara, Kochi 682041, Kerala, India² Department of Pathology, Amrita Institute of Medical Sciences & Research Centre, Amrita Vishwa Vidyapeetham, Ponekara, Kochi 682041, Kerala, India³ Department of Gastroenterology, Amrita Institute of Medical Sciences & Research Centre, Amrita Vishwa Vidyapeetham, Ponekara, Kochi 682041, Kerala, India

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A 55-year-old male, who was a known case of sarcoidosis and had been on steroids for the last 13 years, presented with weight loss over the previous 2–3 months, loss of appetite, intermittent loose stools, abdominal discomfort, and frequent flatulence.

Colonoscopy showed aphthous ulcers (Fig. 1A) in the rectum and in the descending, transverse and ascending colon as well as in the splenic, and hepatic flexures (see Supplementary Material Video S1). Histopathological examination of a biopsy from the ulcerated mucosa showed a dense infiltrate of eosinophils in the lamina propria, associated with patchy ulceration, and *Strongyloides stercoralis* in the mucosal crypts (Fig. 1B). Stool examination showed plenty of rabbitiform larvae of *S. stercoralis* (Fig. 1C). The patient was diagnosed with hyperinfection syndrome due to *S. stercoralis*. *S. stercoralis* is an intestinal pathogen seen both in immunocompetent individuals as well as in those with defects in

cell-mediated immunity [1]. Three 2-day courses of ivermectin 200 µg/kg/day, every 15 days, resulted in a full symptomatic resolution.

Supplementary video related to this article can be found at <https://doi.org/10.1016/j.cmi.2020.09.012>.

Chronic gastrointestinal infection with *S. stercoralis* can have either no symptoms or mild non-specific gastrointestinal, respiratory, and cutaneous symptoms. The increased larval burden can lead to complications such as ileus, gastrointestinal bleeding, intestinal obstruction, and even death. Alteration of immune status results in increased larval load, leading to hyperinfection syndrome. There is exacerbation of gastrointestinal and pulmonary symptoms which is evidenced by demonstration of larvae in the stool and/or sputum [1]. Moreover, the migration of larvae outside the gastrointestinal and respiratory tracts can be observed, causing extrapulmonary and extra-intestinal signs/symptoms.

Among the immunosuppressive drugs, glucocorticoids are the most specifically associated with transforming chronic strongyloidiasis into hyperinfection [1]. Hyperinfection can result from high-dose steroids, low-dose steroids, and even locally injected steroids [1]. Signs and symptoms usually begin as early as 20 days after the onset of steroid therapy, and as late as several years without an obvious additional immunocompromising condition supervening [1]. It is important for clinicians to rule out gastrointestinal infection with *S. stercoralis* in patients on long-term steroids in order to prevent hyperinfection syndrome. In hyperinfection the diagnosis is easily made by stool examination, while in chronic uncomplicated infection stool examination might result in a disappointingly high proportion of false negatives. Hence, screening of at-risk patients should include other specific tests for *S. stercoralis* (for instance stool culture, Baermann test, PCR, and/or serology). With dexamethasone becoming the standard of care for severe COVID-19, the risk of strongyloidiasis reactivation should be considered. It would be worth investigating whether the recommended low-

* Corresponding author. Anil Kumar, Microbiology, Amrita Institute of Medical Sciences & Research Centre, Amrita Vishwa Vidyapeetham, Ponekkara, Kochi, Kerala, India.
E-mail address: vanilkumar@aims.amrita.edu (A. Kumar).

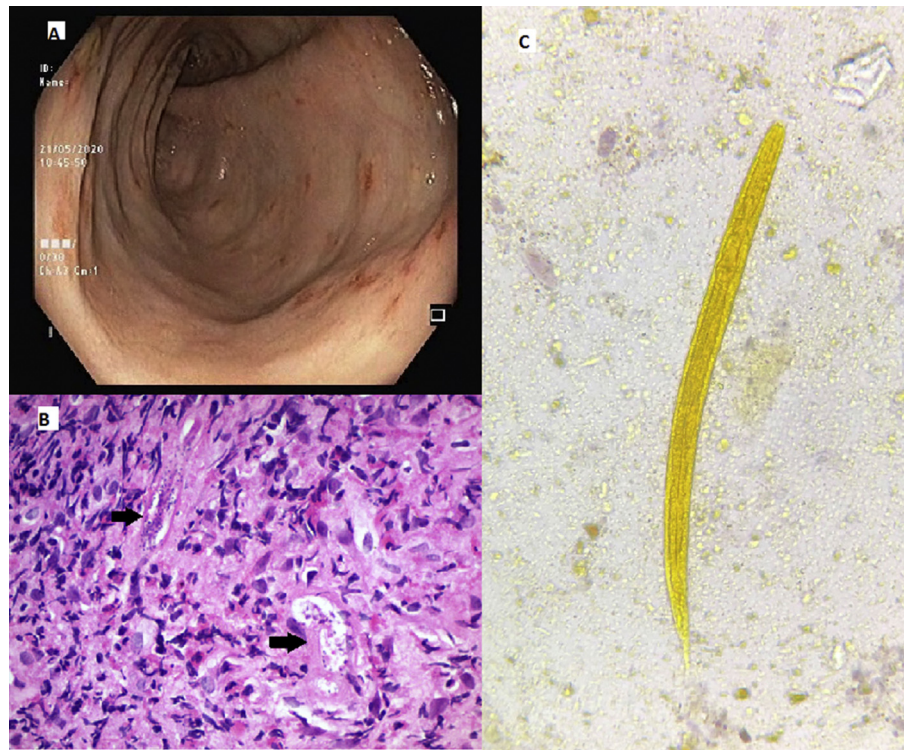


Fig. 1. (A) Colonoscopy showing aphthous ulcers in colon. (B) Colonic biopsy on histopathology (haematoxylin and eosin) showing eosinophilic colitis with *Strongyloides stercoralis* in the mucosal crypts (400X). (C) Stool examination showing rabditiform larvae of *Strongyloides stercoralis* (400X).

dose short course really brings higher risk for hyperinfection syndrome due to *S. stercoralis*.

Author contributions

AK: conceptualization, supervision, validation, investigation, writing—original draft. RP: resources, visualization, investigation, writing—review and editing. SS: resources, visualization, investigation, writing—review and editing. CB: investigation, writing—review and editing. AR: investigation, writing—review and editing. PN: visualization, investigation, writing—review and editing.

Transparency declaration

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Reference

- [1] Ramanathan R, Nutman T. *Strongyloides stercoralis* infection in the immunocompromised host. Curr Infect Dis Rep 2008;10:105–10. <https://doi.org/10.1007/s11908-008-0019-6>.