DOI: 10.7860/JCDR/2025/77508.22119

Case Report

Microbiology Section

Accidental finding of *Strongyloides stercoralis* Hyperinfection in an Immunocompetent Patient: A Case Report

SHAHIN VISHANI[1], DHRUBA HARI CHANDI[2], DIPIKA SHAW[3], SUPRIYA MESHRAM[4], GARGI MUDEY[5]

ABSTRACT

Soil-transmitted helminths commonly present as asymptomatic gastrointestinal discomfort, abdominal pain, diarrhoea, anaemia, and decreased work productivity. They are rarely fatal. *Strongyloides stercoralis* is a soil-transmitted intestinal nematode that can remain asymptomatic for a very long time. Hyperinfection and disseminated infection, commonly associated with immunocompromised patients, can have a grievous outcome. In this case, the patient was admitted to the hospital with an electric burn wound and was treated with partial amputation of the right hand, along with other wounds. During hospitalisation, it was found that he was anaemic with a haemoglobin of 8.3 g/dL, for which he was evaluated. Stool examination revealed multiple larvae of *S. stercoralis*, suggestive of hyperinfection. The patient was treated to prevent further complications and was discharged later. This implies the importance of having a high index of suspicion, while evaluating patients in tropical and subtropical climates for parasitic infections.

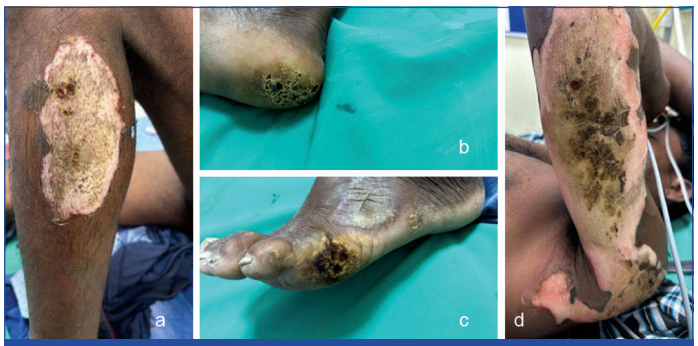
Keywords: Disseminated infection, Eosinophilia, Multiple larvae, Soil-transmitted nematodes

CASE REPORT

A 40-year-old male, previously healthy construction worker, was brought to the casualty with a history of electric burn injury on the right forearm (entry wound). There was oedema, skin necrosis and pigmentation on the right hand, the periphery was cold, the bone was exposed on the third and fourth digits, and the distal phalanx was amputated [Table/Fig-1]. The right radial artery was exposed, and the right ulnar artery and brachial artery were palpable. Superficial lacerated wounds were present on the right arm, right foot, and left leg (exit wound) [Table/Fig-2]. There was no history of head trauma, confusion, seizure, ear, nose or throat bleed, or abdominal trauma. Patient was not a known case of diabetes mellitus, hypertension, bronchial asthma or tuberculosis. There was no past history of any surgery performed.

[Table/Fig-1]: Electric burn wound of the patient's right forearm (entry wound), showing oedema, skin necrosis and pigmentation on the right hand, bones are exposed on the third and fourth digits, and the distal phalanx is amputated.

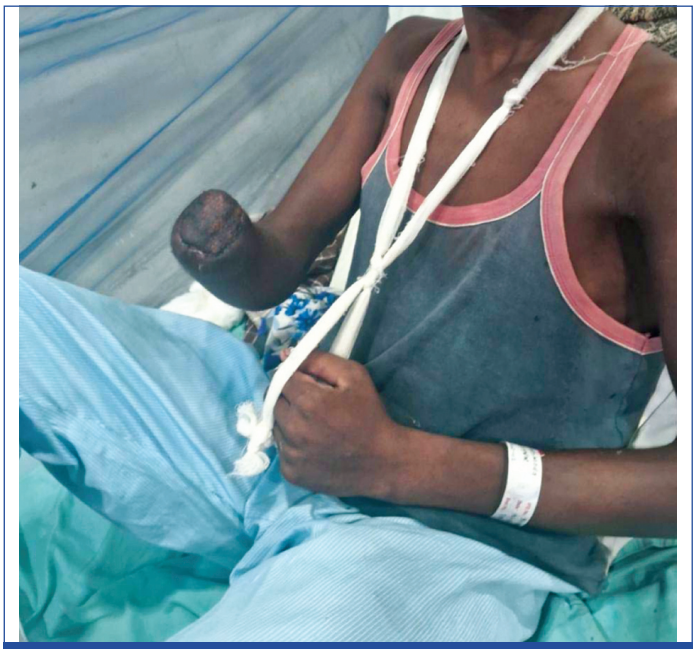
On the day of admission, emergency fasciotomy was performed up to the wrist. Partial amputation of third distal phalanx was done after two days because of dry gangrene. Revision fasciotomy



[Table/Fig-2]: Represents the exit wound. a) left leg; b,c) right foot; and d) right arm.

was done after four days, as the initial fasciotomy was found to be inadequate and it was extended up to the forearm. After 19 days of injury, the patient was operated on for right below-elbow guillotine amputation. Intraoperatively, the radial artery was found to be charred. Pus discharge was collected intra-operatively and sent for culture and sensitivity at the microbiology laboratory. It showed growth of *Pseudomonas aeruginosa*, which was sensitive to piperacillin-tazobactam and colistin and resistant to ceftazidime, cefipime, ciprofloxacin, tobramycin, imipenem, and meropenem. On the day of admission, the patient's haemoglobin was 13.6 g/dL. All investigation results were within normal limits. His Human Immunodeficiency Virus (HIV) status was negative. After one month of admission patient's haemoglobin was reduced to 8.3 g/dL, for which he was evaluated by peripheral smear, which showed a microcytic hypochromic picture; no malaria parasite was seen, occult blood stool was negative, and absolute eosinophil count was raised to 1900 cells/cubic mm. Stool examination revealed multiple larvae of *S. stercoralis*. This was suggestive of hyperinfection. Final diagnosis of patient was operated case of split skin grafting over stump on right below elbow guillotine amputation and non healing ulcer over left lateral arm, left leg and hyperinfection with *S. stercoralis*. The patient was given two units of blood transfusion and treated with albendazole 400 mg and ivermectin 6 mg for three days as per the physician's advice. After which, stool examination did not reveal any larvae, ova or parasites. During the hospital stay

of 51 days, the patient, because of a burn wound and repeated surgical procedures as mentioned above, was prescribed multiple antibiotics. He received an injection of ceftriaxone 1 gm i.v. bd for 14 days, injection piperacillin tazobactum 4.5 gm i.v. bd for five days, injection clindamycin 600 mg i.v. bd for 14 days, tablet cefixime bd for 14 days, and tablet linezolid for seven days. The patient was symptomatically better and hemodynamically stable and therefore was discharged [Table/Fig-3]. The patient was asked to follow up in the medicine and surgery Outpatient Department (OPD); however, the patient did not turn up.



[Table/Fig-3]: Postoperative image of right below elbow guillotine amputation.

DISCUSSION

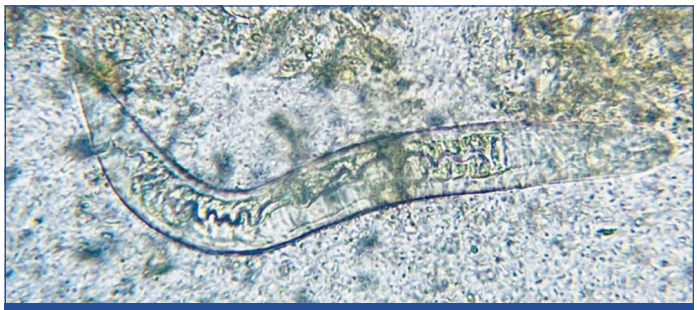
The prevalence of *S. stercoralis* infection was 8.1% in 2017, which is equivalent to 613.9 million people. As per the World Health Organisation (WHO), the Southeast Asia region shows a higher rate of infection as compared to other regions [1]. Nearly 25% of patients of soil-transmitted nematodes are reported from India, making the region endemic [2]. Therefore, people working in farms, living in rural areas, socioeconomically weak (marginalised), and having a habit of walking barefoot have higher chances of acquiring such infections [3]. The study performed by Munisankar S et al., suggests 33% seroprevalence of *S. stercoralis* infection with 36.1% prevalence in males compared to 29.8% in females in South India [4]. In our case, the patient is a male construction worker in a rural area in India with low socioeconomic status who may have acquired it while working barefoot.

S. stercoralis can have variable presentations like acute infections, chronic infections, hyperinfection, and disseminated infection [3]. The change in the immune status of the patient can lead to hyperinfection, disseminated infection and even death if not diagnosed due to the increased rate of autoinfection [3,4].

In this case, a 40-year-old male asymptomatic immunocompetent patient was reported. Ra H et al., also reported accidental finding of *S. stercoralis* infection in an 84-year-old asymptomatic immunocompetent patient [5]. Yahaya JJ et al., reported a case of a 56-year-old immunocompetent male patient; however, the patient had fever, chronic diarrhoea for 9 months [6]. Bharti S et al., in contrast, reported a case of a 46-year-old female with abdominal pain and distension for one month with a history of steroid intake for joint pain [7]. Guerrero-Wooley R et al., and Pedersen AA et al., reported a 64-year-old male and a 70-year-old male, respectively, with respiratory and central nervous system involvement culminating in death due to disseminated infection in immunocompromised patients [8,9].

Approximately 38.8% of individuals showed eosinophilia in the study performed by Munisankar S et al., [4]. In this case study, absolute eosinophil count was found to be raised to 1900 cells/cubic mm; similar findings were observed by Yahaya JJ et al., Pedersen AA et al., while Bharti S et al., and Guerrero-Wooley R et al., reported normal absolute eosinophil count [6-9]. The presence of eosinophilia may suggest parasitic infections, including *S. stercoralis*, but the absence of eosinophilia cannot rule out strongyloidiasis [7,8].

Immunocompetent patients who are chronically infected with *S. stercoralis* mostly remain asymptomatic, making it challenging to diagnose [3,6]. The larval output is also irregular and intermittent; thus, a single stool examination may not be sufficient to label a patient negative. [6]. On the other hand, the stool examination of hyperinfection or disseminated infection in a patient with *S. stercoralis* shows the presence of abundant larvae [10]. In this case study, though the patient was asymptomatic, the patient had abundant larvae present in the stool examination as shown in [Table/Fig-4], suggestive of hyperinfection while he was evaluated for anaemia. Similar to our study, Pedersen AA et al., also identified *S. stercoralis* in stool microscopy [9]. Studies by Ra H et al., Yahaya JJ et al., and Bharti S et al., detected *S. stercoralis* on histopathological examination, while Guerrero-Wooley R et al., identified it from tracheal aspirate [5-8].



[Table/Fig-4]: Larvae of *Strongyloides stercoralis*.

In this case study, the patient was given albendazole 400 mg and ivermectin 6 mg for three days as per the physician's advice. Bharti S et al., also reported similar treatment for three days, while, in contrast to our study, Yahaya JJ et al., treated the patient with ivermectin only for 14 days, after which the patient did turn up for follow-up, where stool microscopy and *Strongyloides* IgG antibodies reports were negative [6,7]. In the case study by Pedersen AA et al., the patient was treated with ivermectin and albendazole for 37 days, after which clearance of infection was confirmed by real-time PCR from Cerebrospinal Fluid (CSF) and culture of stool sample by filter paper method, but the patient died of respiratory failure [9]. However, in the case reported by Guerrero-Wooley R et al., the patient could not be saved and died of respiratory failure [8].

Research has shown that *S. stercoralis* infection is known to cause hyperinfection and disseminated disease in immunocompromised patients [3]. Murine model studies have shown that after treatment, antibiotics decrease bacterial diversity. It is also observed that cytokine production is altered by CD4+ T lymphocytes and a change in resistance to intestinal pathogens [11]. Therefore, a broad-spectrum antibiotic, though not reported earlier, could possibly decrease gastrointestinal immunity and increase the chances of gastrointestinal infections; in this case, increasing the opportunity of autoinfection led to hyperinfection. Further research needs to be done to establish the relationship between broad-spectrum antibiotic treatment and intestinal parasitic infections.

CONCLUSION(S)

The timely diagnosis of *S. stercoralis* prevented complications of disseminated infections in this patient. The present case report highlights the importance of screening even immunocompetent anaemic patients with or without eosinophilia coming from

endemic areas for gastrointestinal parasitic infections, particularly with *S. stercoralis*.

REFERENCES

[1] Buonfrate D, Bisanzio D, Giorli G, Odermatt P, Fürst T, Greenaway C, et al. The global prevalence of Strongyloides stercoralis infection. Pathogens. 2020;9(6):468.
[2] Salam N, Azam S. Prevalence and distribution of soil-transmitted helminth infections in India. BMC Public Health. 2017;17:01-02.
[3] Yeh MY, Aggarwal S, Carrig M, Azeem A, Nguyen A, Devries S, et al. Strongyloides stercoralis infection in humans: A narrative review of the most neglected parasitic disease. Cureus. 2023;15(10):e46908.
[4] Munisankar S, Rajamanickam A, Balasubramanian S, Muthusamy S, Dolla CK, Menon PA, et al. Seroprevalence of Strongyloides stercoralis infection in a South Indian adult population. PLoS Negl Trop Dis. 2022;16(7):e0010561.
[5] Ra H, Chung JW, Chung DH, Kim JH, Kim YJ, Kim KO, et al. Strongyloidiasis presenting as yellowish nodules in colonoscopy of an immunocompetent patient. Clin Endoscopy. 2019;52(1):80-82.
[6] Yahaya JJ, Morgan ED, Othieno E. Duodenal Strongyloides stercoralis infection in a 56-year old male: A case report. Int J Surg Open. 2023;57:100651.
[7] Bharti S, Singh A, Kirti R, Kumar N. Gastroduodenal strongyloidiasis causing protein losing enteropathy–A case report and brief review of literature. J Adv Med Med Res. 2021:232-36.
[8] Guerrero-Wooley R, Aranda-Aguirre E, Li W, Wilkin A, Palavecino E. Case report: Strongyloides stercoralis hyperinfection in a patient with chronic lymphocytic leukemia. Am J Trop Med Hygiene. 2017;97(5):1629.
[9] Pedersen AA, Hartmeyer GN, Stensvold CR, Martin-Iguac el *R. Strongyloides* stercoralis hyperinfection syndrome with cerebral involvement. BMJ Case Rep. 2022;15:e247032. Doi: 10.1136/bcr-2021-247032.
[10] Luvira V, Siripoon T, Phiboonbanakit D, Somsri K, Watthanakulpanich D, Dekumyoy P. Strongyloides stercoralis: A neglected but fatal parasite. Trop Med Infect Dis. 2022;7(10):310.
[11] Patangia DV, Ryan CA, Dempsey E, Ross RP, Stanton C. Impact of antibiotics on the human microbiome and consequences for host health. Microbiologyopen. 2022;11(1):e1260.

PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Microbiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
2. Associate professor, Department of Microbiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Medical Education and Research, Wardha, Maharashtra, India.
3. Assistant Professor, Department of Microbiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
4. Professor, Department of Microbiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Medical Education and Research, Wardha, Maharashtra, India.
5. Professor and Head, Department of Microbiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Medical Education and Research, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Gargi Mudey,
Professor and Head, Department of Microbiology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Higher Medical Education and Research, Wardha-442001, Maharashtra, India.
E-mail: gargimudey@hotmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Dec 31, 2024
- Manual Googling: Apr 25, 2025
- iThenticate Software: Sep 26, 2025 (6%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Dec 26, 2024**
Date of Peer Review: **Apr 13, 2025**
Date of Acceptance: **Sep 30, 2025**
Date of Publishing: **Dec 01, 2025**