Caspian Journal of Internal Medicine 2026 (Spring); 17(2): 470-475
DOI: 10.22088/cjim.17.2.470

Original Article

Strongyloides steroralis: A case report to manifest the diagnosis and treatment

Faezeh Firuzpour (MD) [1]
Pedram Beigvand (MD) [2*]
Niloofar Moradi (MD) [1]
Hadis Zaboli [3]
Fatemeh Jafarpour [3]
Zahra Naghdizadeh [3]
Maryam Adabi [3]

1. Faculty of Medicine, Babol University of Medical Sciences, Babol, Iran
2.Department of Internal Medicine, Babol University of Medical Sciences, Babol, Iran
3. Student Research Committee, Babol University of Medical Sciences, Babol, Iran

*** Correspondence:**
Pedram Beigvand, Department of Internal Medicine, Babol, Iran

E-mail:
pedrambigvand@gmail.com
Tel: +98 1132256005

Received: 1 Oct 2021
Revised: 17 Aug 2022
Accepted: 10 Sep 2022
Published: 10 March 2026

Abstract

Background: *Strongyloides stercoralis* is a soil-transmitted intestinal nematode capable of establishing chronic autoinfection, allowing infection to persist for decades. Its nonspecific clinical manifestations and variable presentation often result in delayed diagnosis, particularly in older adults and in endemic regions, where unrecognized infection may progress to severe complications.

Case Report: A 78-year-old man presented with progressive bilateral lower-extremity edema lasting four months, accompanied by functional class II dyspnea, fever, chills, night sweats, nausea, lethargy, and an unintentional 20-kg weight loss over eight months. Laboratory and imaging investigations failed to identify a clear etiology, prompting further diagnostic evaluation. Histopathological examination together with stool analysis ultimately confirmed *Strongyloides stercoralis* infection associated with protein-losing enteropathy. The patient was treated with albendazole for seven days, leading to marked clinical improvement and complete resolution of symptoms during follow-up, with recovery of nutritional status and no evidence of recurrence.

Conclusion: This case highlights the diagnostic challenge posed by strongyloidiasis in elderly patients presenting with nonspecific constitutional symptoms and protein-losing enteropathy. Clinicians practicing in endemic settings or caring for individuals with relevant epidemiologic risk factors should maintain a high index of suspicion, even in the absence of classic gastrointestinal manifestations or eosinophilia. Early recognition, appropriate parasitological and histopathological investigations, and timely antiparasitic therapy are essential to achieve favorable outcomes and prevent potentially life-threatening complications, including hyperinfection syndrome and disseminated disease.

Keywords: Strongyloides Stercoralis, Strongyloidiasis, Protein-loss enteropathy.

Citation:
Firuzpour F, Beigvand P, Moradi N, et al. Strongyloides steroralis: A case report to manifest the diagnosis and treatment; 17(2): 470-475.

The Strongyloides genus comprises a group of parasitic nematodes that are significant pathogens of terrestrial vertebrates, including humans. These nematodes are classified as Soil-Transmitted Helminths (STH) and are described by the World Health Organization (WHO) as Neglected Tropical Diseases (NTDs) (1, 2). Strongyloides exhibit a complex life cycle characterized by both free-living and parasitic stages, along with a unique ability to undergo autoinfection which allows it to maintain a chronic presence within hosts, allowing the parasite to endure in the host for decades, frequently remaining asymptomatic until circumstances favoring hyper infection emerge (3, 4).The diagnosis of chronic infections caused by this parasite can be challenging for physicians, especially when the disease is not commonly suspected. These parasites often establish long-lasting infections with minimal or no clinical manifestations, complicating the identification process (5, 6). The clinical presentations of acute infection are closely associated with the migration of larvae within the host Strongyloides often presents as an asymptomatic infection; however, patients may exhibit a range of symptoms categorized into four primary areas: gastrointestinal, skin, pulmonary, and constitutional symptoms.

In terms of gastrointestinal manifestations, individuals may report abdominal discomfort, bloating, nausea, and vomiting, as well as episodes of intermittent diarrhea and constipation (7, 8). Skin manifestations can include a serpiginous rash, which results from the larvae migrating beneath the skin. Patients may also experience pulmonary symptoms such as cough, dyspnea, and wheezing. In certain instances, Loeffler syndrome may present as a form of eosinophilic pulmonary disease, characterized by symptoms such as cough and elevated peripheral blood eosinophil levels (9). Additionally, constitutional symptoms may manifest as fatigue, weakness, and an elevated eosinophil count. Of particular concern is the potential for hyperinfection syndrome in immunocompromised individuals, which can lead to disseminated infection and severe gastrointestinal distress, including complications such as obstruction or bleeding. Extensive larval migration in the lungs may result in respiratory failure, highlighting the serious nature of this condition in susceptible populations (10, 11). In particular, parasite penetration in immunosuppressive patients shows an overwhelming boost in parasite load due to the autoinfection cycle (5).

Upon epidemiological aspect, Strongyloides stercoralis exhibits the highest prevalence in Southeast Asia, with an estimated 237.3 million people infected, often merged with poor sanitation and agricultural practices. In the Western Pacific Region, approximately 133.2 million individuals are affected. Sub-Saharan Africa reports around 108.1 million cases, with particularly high prevalence rates observed in countries such as Sierra Leone (17%), Liberia (16%), and Sao Tome and Principe (20.7%). The infection is notably widespread in resource-limited areas where sanitation infrastructure is inadequate. In Central America, significant rates of infection can also be seen, particularly in Panama and Colombia, where levels may reach as high as 18.4%. Although the prevalence of Strongyloides stercoralis is lower in other regions, it remains present in parts of Australia and selected areas of the United States (12). Strongyloidiasis can be diagnosed by detecting the morphological identification of larvae in stool samples which is considered a gold standard diagnostic test. In cases of low parasite load, one stool examination might show a false negative result in 70% of cases that can be resolved by multiple samples (13, 14). If the sample does not yield a false positive result due to cross-reactivity with other helminths, serological assays can be effective in detecting S. stercoralis. Additionally, polymerase chain reaction (PCR) and tissue biopsy are alternative diagnostic methods (15). PCR is more sensitive than the other methods mentioned. In selected cases, tissue biopsies and bronchoalveolar lavage can also be utilized overall, it is recommended to use a combination of diagnostic methods to improve accuracy. The absence of standardized diagnostic protocols, along with the presence of low parasite loads, significantly contributes to both underdiagnosis and misdiagnosis in endemic regions. Consequently, many cases may remain undetected for extended periods, potentially resulting in serious complications if left untreated (13).

Therapeutic strategies for Strongyloides stercoralis implicate antiparasitic medications, with Ivermectin at a dosage of 200 micrograms per kilogram (µg/kg) once daily for two consecutive days, achieving a high cure rate of 94-100%, which makes it the preferred standard treatment (16, 17). An alternative option is Albendazole, which entails taking 400 mg twice a day for a week. In comparison to Ivermectin, Albendazole has a lower cure rate of approximately 38-45% and may necessitate repeat courses to ensure the complete eradication of larvae (18, 19). Thiabendazole can be administered at a dose of 25 mg/kg orally twice daily for three days, especially in more complex cases. For individuals experiencing hyperinfection syndrome or who cannot take oral medications, subcutaneous administration of Ivermectin may be required. In these situations, treatment might need to be prolonged until stool cultures return negative for a period of two weeks. Herein, we describe a 78-year-old male patient with a progressive lower limb edema, Functional class II dyspnea, night sweats, fever, and a significant weight loss of 20 kg, owing to the presence of Strongyloides stercoralis larvae in his stool examination

Case Presentation

Valid and appropriate informed consent was obtained in this case report. A 78-year-old male patient was referred to the internal medicine ward due to lower limb edema, which has persisted for four months and has notably worsened over the last month. Recently, this edema has progressed to involve the abdominal region within the past two days. The patient also reported experiencing MMRC II (Modified Medical Research Council) exertional dyspnea. Over the past year, he has suffered from progressive weakness, lethargy, and a significant loss of appetite, contributing to a weight loss of 20 kg over eight months. He has a history of night sweats, fever, chills and he has experienced nausea for the past week. The patient's past medical history includes Benign Prostatic Hyperplasia (BPH), ischemic heart disease (IHD), and anemia. Due to the anemia, he received injection of three packed red blood cells blood cells within the last

year. An endoscopy previously indicated the presence of gastritis, and a colonoscopy revealed a 1 x 1 cm polyp in the transverse colon. His current medications comprise Furosemide 40 mg, Pantoprazole 40 mg, ferrous bisglycinate 28 mg, and Folic acid 5 mg. Upon physical examination, the patient presented with pale conjunctiva and periorbital edema. Chest examination findings included retractions and the use of accessory respiratory muscles. Lung auscultation revealed rales in the lower third of both lungs, along with diminished sounds at the bases of both lungs. Cardiac auscultation indicated muffled heart sounds. Limb examination showed 3+ edema in the lower extremities and weak peripheral pulses. Upon admission, the patient's blood pressure was recorded at 80/50 mmHg, heart rate at 90 beats per minute, and oxygen saturation at 90% on room air. Complete laboratory findings are reviewed in (tables 1-3). On echocardiography, Ejection Fraction (EF: 55%), Mild Pleural Effusion (PE), Moderate AS (Aortic Stenosis), Mild MR (Mitral regurgitation), and Mild to Moderate AI (Aortic Insufficiency) were seen.

Table 1. Initial laboratory tests

Variables		Variables	
WBC	15300	**AST**	23
Hb	8.2	**ALT**	25
MCV	57.2	**ALK**	291
RBC	4.42	**Bilirubin Total**	0.8
Platelet	352000	**Bilirubin Direct**	0.2
ESR	4	**Na**	123
CRP	52	**K**	3.1
BUN	8	**Cr**	0.9
Uric acid	6.2	**Ca**	8.5
Troponin	Negative	**P**	3.2
Creatinine U/A 24 h	0.55	**PT**	14
Protein U/A 24 h	1386	**PTT**	52
Volume U/A 24 h	2000	**INR**	1.2

WBC: white blood cell, Hb: hemoglobin, MCV: Mean Corpuscular Volume, RBC: Red Blood Cell, AST: Aspartate Aminotransferase, ALT: Alanine aminotransferase, ALK Alkaline Phosphatase, ESR: Erythrocyte Sedimentation Rate, CRP: C - reactive protein,
PT: Prothrombin Time, PTT: Partial thromboplastin time, INR: International Normalized Ratio.

Abdominal and pelvic ultrasound revealed increased liver parenchymal echo, indicating grade 1 fatty liver. Free fluid was seen around the liver and spleen; bilateral pleural effusions were seen as well. Positive findings on Spiral Lung CT scan indicated bilateral moderate pleural effusion with collapse consolidation of adjacent lung segments (figure 1). There was a leftward shift of the heart and mediastinum. Calcification of the aorta and coronary arteries was seen, likewise free fluid around the liver. In Peripheral Blood Smear (PBS); at the RBC level, moderate anisocytosis, mild hypochromia, and poikilocytosis were seen. WBC Count was normal and PMN dominant (Neutrophile: 82%, Monocytes 10%, Eosinophil 6%), and platelet was normal. Serum Protein Electrophoresis (SPEP) showed Polyclonal gammopathy. Chronic inflammation was suspected to be due to malabsorption and malnutrition, indicated by the presence of anemia, hypoalbuminemia, hypoproteinemia, hypocholesterolemia, hypomagnesemia, and hypokalemia. The result of HIV test was negative. Therefore, decision to perform an upper GI endoscopy and evaluation of small bowel was made. Endoscopy indicated a large sliding hiatal hernia, and mild gastroduodenitis. Samples were taken from gastric corpus and antrum, and duodenum, and sent for histologic assessment. Histologic evaluation revealed moderate duodenitis with the presence of Strongyloides Stercoralis larva in duodenal mucosa, and chronic gastritis with prominent eosinophilic infiltration at stomach. Approving this finding, in the stool exam of the patient, Strongyloides Stercoralis larva was seen, due to the unavailability of Ivermectin, Albendazole was prescribed and all symptoms were resolved by consuming Albendazole for about 7 days. After a month follow-up, the result of laboratory data was improved, and the patient had considerably gained weight.

Table 2. Urine analysis and VBG test

Urine Analysis		VBG test	
SG	1.026	**PH**	7.36
WBC	Many	**PCO2**	44
RBC	35-40	**Lactate**	2.5
Bacteria	Moderate	**HCO3**	24.9
Protein	Trace		
Blood	3 +		

WBC: white blood cell, RBC: Red Blood Cell, VGB: venous blood gases, SG: Specific Gravity, PH: hydrogen ion concentration, PCO2: Partial pressure of carbon dioxide, HCO3: Bicarbonate.

Table 3. Secondary lLaboratory findings

Albumin	**1.3**	**PPD test**	**Negative**
Total Protein	3.4	**HIV test**	Negative
Cholesterol	60	**Iron**	20
TG	84	**TIBC**	157
HDL	24	**Ferritin**	50
LDL	20	**Mg**	1.5

PPD test: Purified protein derivative, HIV: Human immunodeficiency virus, TIBC: Total Iron Binding Capacity, TG Triglycerides, HDL: High Density Lipoproteins, LDL: Low Density Lipoproteins.

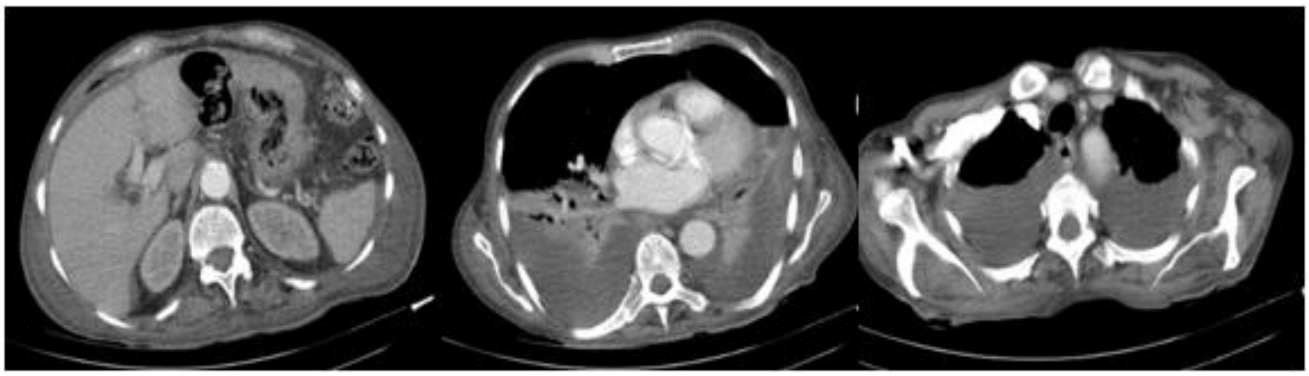

Figure 1. CT scan showed a bilateral pleural effusion in the patient.

Discussion

Strongyloides stercoralis is a soil-transmitted parasite that can manifest clinically in various forms, including acute infections, chronic persistent infections, and severe disseminated infections, having the potential to yield long-lasting and sometimes fatal ailments (20). The presentation of the disease can vary, encompassing dermatological, gastroenterological, and pulmonary manifestations. In this case, our patient did not exhibit any skin-related symptoms, such as pruritus or rash, which complicates the final diagnosis. Conversely, the gastroenterological symptoms were more pronounced, characterized by nausea, vomiting, and significant weight loss. Furthermore, the pulmonary symptom of dyspnea classified as MMRC II was notable, along with other constitutional symptoms including lethargy, fatigue, night sweats, fever, and chills. Previous research indicates that nearly 50% of individuals infected with Strongyloides may experience no symptoms throughout their ailment span. Among those exhibiting gastrointestinal symptoms, abdominal pain is reported in approximately 32.7% of symptomatic individuals, while diarrhea is noted in about 17%. In terms of pulmonary manifestations, coughing and wheezing occur in roughly 12.7% of cases. Although constitutional symptoms such as fatigue, weakness, and generalized pain are prevalent, they lack precise statistical quantification (21). Skin manifestations, including pruritic rashes and irritation, are commonly observed, particularly at the site of larval entry; however, their exact prevalence remains poorly defined. Additionally, urticaria has been documented in certain instances, especially around the anal region. Our patient experienced a complication known as protein-losing enteropathy (PLE), caused by the significant involvement of the small intestine due to Strongyloides stercoralis infection. This condition resulted in extensive malabsorption and decreased levels of albumin, proteins, lipids, and electrolytes, which must be addressed carefully . Parasitic infections are notable among the various potential causes of protein-losing enteropathy. These infections can lead to PLE through several mechanisms. Some parasites can cause inflammatory and erosive damage to the intestinal lining, which allows proteins to leak into the intestinal lumen. This type of damage is commonly seen in infections caused by Strongyloides stercoralis and Giardia lamblia (22-24). Moreover, parasitic infections can increase intestinal permeability, allowing proteins to move from the interstitial space into the intestines, further exacerbating protein loss. Strongyloidiasis has been identified as a significant contributor to PLE, especially in endemic regions. It is important to note that even without obvious immune suppression, Strongyloidiasis can still lead to substantial protein loss. In the management setting, a study

conducted by Adenusi A. et al. (25) compared the efficacy of ivermectin and thiabendazole. The results showed that ivermectin had a higher efficacy of 84.07% compared to 78.64% for Thiabendazole. However, this difference was not statistically significant, as indicated by a p-value of greater than 0.05. In a clinical trial by Henriquez-Chamaco (19), the comparison also revealed either a slight difference or no difference at all in curability between the two medications. Besides, side effects of ivermectin were reported in 20.9% of cases compared to 73.1% for those prescribing thiabendazole (18). The effectiveness of Albendazole shows considerable differences based on the study's design and the population of patients involved (26). Cure rates have been documented to range from about 73% to 100%, depending on the treatment approach used. For instance, one study reported a 73% cure rate following a single three-day treatment, while another achieved a full 100% cure rate when the treatment was repeated after one week. However, some findings demonstrate lower effectiveness, with some studies reporting cure rates between 28% and 47% (27). Albendazole is commonly regarded as a second-line treatment option for Strongyloides. Nonetheless, there are some circumstances where albendazole may be preferred over ivermectin (28), especially in areas where access to ivermectin is limited. In cases involving pregnant patients or individuals with neurological disorders, the use of ivermectin is contraindicated. Besides that, ivermectin has side effects include edema, rash, headache, and ocular complaints which makes it inappropriate choice because of our patient’s edema (29).

For that reason, albendazole is the preferred choice. Furthermore, when addressing co-infections with other parasites such as Ascaris lumbricoides or Trichuris trichiura, a combination therapy of ivermectin and albendazole is recommended. Following a thorough assessment of the patient's condition and an in-depth examination, it was concluded that ivermectin would not be an appropriate treatment option due to its potential side effects. Instead, we administered Albendazole over a one-week period. Additionally, since ivermectin was not available in our pharmacopeia, we chose to utilize piperacillin-tazobactam to effectively manage the patient's fever and chronic symptoms. The patient's progress was subsequently monitored through two stool tests conducted two weeks apart. Following this treatment, the patient's overall condition showed significant improvement, and the symptoms were resolved. Additionally, the patient's constitutional symptoms were eliminated and weight gain was resulted as part of the follow-up assessment.

Acknowledgments

We would like to acknowledge the Research Department of Babol University of Medical Sciences, Iran for supporting this research.

Funding: This case report did not receive any specific funding from commercial or non-profit agencies.

Ethics approval: The research protocol was designed in accordance with the Declaration of Helsinki, and was approved by the Ethics Committee of Babol University of Medical Sciences with identification code: IR.MUBABOL.HRI.REC.1404.099.

Conflict of interest: The authors declared that this study has received no financial support.

Consent for publication: The patient provided written informed consent to publish this case report and allow the use of radiological images.

Authors’ contribution: P.B: Supervisor, Conceptualization. F.F: Study design, writing the manuscript, Submitting. N.M: Interpretation, Conceptualization. H.Z, F.J, Z.N, M.A: Data Collection, Edition, Data Analysis, Writing the manuscript. All authors approved the final article for publication.

References

1. Viney M. Strongyloides. Parasitology 2017; 144: 259-62.
2. Czeresnia JM, Weiss LM. Strongyloides stercoralis. Lung 2022; 200: 141-8.
3. Wyllie R, Hyams JS, Kay M. Pediatric gastrointestinal and liver disease: pathophysiology, diagnosis, management. 3rd ed. Saunders Elsevier 2006.
4. Yeh MY, Aggarwal S, Carrig M, et al. Strongyloides stercoralis infection in humans: a narrative review of the most neglected parasitic disease. Cureus 2023; 15: e46908.
5. Tiberti N, Manfredi M, Piubelli C, Buonfrate D. Progresses and challenges in *Strongyloides* spp. proteomics. Philos Trans R Soc Lond B Biol Sci. 2024; 379: 20220447.
6. Yang R, Xu M, Liao Y, et al. Human Strongyloides stercoralis infection. J Microbiol Immunol Infect 2025; 58: 164-79.
7. Gordon CA, Utzinger J, Muhi S, Becker SL, Keiser J, Khieu V, Gray DJ. Strongyloidiasis. Nat Rev Dis Primers 2024; 10: 6.
8. Luvira V, Siripoon T, Phiboonbanakit D, et al. Strongyloides stercoralis: a neglected but fatal parasite. Trop Med Infect Dis 2022; 7: 310.

9. Alabi A, Boggild AK, Bitnun A. Acute strongyloidiasis in a child recently returned from vacation in Cuba. Canadian Med Assoc J 2017; 189: E1416-20.
10. Nutman TB. Human infection with Strongyloides stercoralis and other related Strongyloides species. Parasitology 2017; 144: 263-73.
11. Karanam L SK, Basavraj GK, Papireddy CKR. Strongyloides stercoralis hyper infection syndrome. Indian J Surgery 2021; 83: 582-6.
12. Chan AHE, Kusolsuk T, Watthanakulpanich D, et al. Prevalence of Strongyloides in Southeast Asia: a systematic review and meta-analysis with implications for public health and sustainable control strategies. Infect Dis Poverty 2023; 12: 83.
13. Siddiqui AA, Berk SL. Diagnosis of Strongyloides stercoralis infection. Clin Infect Dis 2001; 33:1 040-7.
14. Wammes LJ, van Asten SAV, van Lieshout L, Wessels E, Verweij JJ. Real-time PCR for diagnosing and monitoring treatment effect of *Strongyloides stercoralis* infection in a non-endemic setting. Front Parasitol 2023; 2: 1277372
15. Hailu T AA, Nibret E, et al. Evaluation of five diagnostic methods for Strongyloides stercoralis infection in Amhara National Regional State, northwest Ethiopia. BMC Infect Dis 2022; 22: 297.
16. Montes M, Sawhney C, Barros N. Strongyloides stercoralis: there but not seen. Curr Opin Infect Dis 2010; 23: 500-4.
17. Segarra-Newnham M. Manifestations, diagnosis, and treatment of Strongyloides stercoralis infection. Ann Pharmacother 2007; 41: 1992-2001.
18. Requena-Méndez A, Buonfrate D, Gomez-Junyent J, et al. Evidence-based guidelines for screening and management of Strongyloidiasis in nn-endemic countries. Am J Trop Med Hyg 2017; 97: 645-52.
19. Henriquez-Camacho C, Gotuzzo E, Echevarria J, et al. Ivermectin versus albendazole or thiabendazole for Strongyloides stercoralis infection. Cochrane Database Syst Rev 2016; 2016: CD007745.
20. Bhasin A, Yura E, Boyd D, Kuksuk L, Flaherty JP. Case report: Incidentally discovered strongyloides stercoralis infection after urinary diversion. Am J Trop Med Hyg 2020; 102: 1396.-8.
21. Ashiri A, Rafiei A, Beiromvand M, Khanzadeh A, Alghasi A. Screening of Strongyloides stercoralis infection in high-risk patients in Khuzestan Province, Southwestern Iran. Parasit Vectors 2021; 14: 37.
22. Nagra N, Dang S. Protein-Losing Enteropathy. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK542283/. Accessed Jun 12, 2023.
23. Wang Y, Zhang X. Gastroduodenal strongyloidiasis infection causing protein-losing enteropathy: a case report and review of the literature. Heliyon 2023; 9: e18094.
24. Elshamy MH, Mahmoud TM, Ayesh Othman MM. Strongyloidiasis as a hidden cause of protein losing enteropathy. Afro- Egypt J Infect Endem Dis 22021; 11: 314-7.
25. Adenusi A, Oke A, Adenusi A. Comparison of ivermectin and thiabendazole in the treatment of uncomplicated human Strongyloides stercoralis infection. African J Biotech 2003; 2: 465-9.
26. Pungpak S, Bunnag D, Chindanond D, Radmoyos B. Albendazole in the treatment of strongyloidiasis. Southeast Asian J Trop Med Public Health 1987; 18: 207-10.
27. Datry A, Hilmarsdottir I, Mayorga-Sagastume R, et al. Treatment of Strongyloides stercoralis infection with ivermectin compared with albendazole: results of an open study of 60 cases. Transactions of the Royal Society of Tropical medicine and Hygiene 1994; 88: 344-5.
28. Gobbi F, Buonfrate D, Tamarozzi F, et al. Efficacy of high-dose albendazole with ivermectin for treating imported loiasis, Italy. Emerging Infectious Diseases 2019; 25: 1574-6.
29. Johnson-Arbor K. Ivermectin: a mini-review. Clin Toxicol (Phila) 2022; 60: 571.