



ISSN NO. 2320-5407

Journal homepage: <http://www.journalijar.com>

INTERNATIONAL JOURNAL  
OF ADVANCED RESEARCH

## RESEARCH ARTICLE

## Hyperinfection with *Strongyloides stercoralis* in an asthmatic patient on corticosteroids.

\*Dr. Gulnaz Bashir,<sup>1</sup> Dr. Mushtaq A. Khan,<sup>2</sup> Dr. Fayaz A.Wani,<sup>3</sup> Mr. Bashir A.Sofi.<sup>4</sup>

1. **M.D Microbiology.** Additional Professor, Microbiology, SKIMS, Srinagar. Kashmir. India.

2. **D.M Gastroenterology.** Additional Professor, Gastroenterology, SKIMS, Srinagar. Kashmir. India.

3. **M.D Medicine.** Consultant General Medicine, SMHS, Srinagar. Kashmir. India.

4. **M.Sc. Microbiology.** Tutor, Microbiology, SKIMS, Srinagar. Kashmir. India.

### Manuscript Info

#### Manuscript History:

Received: 15 November 2014

Final Accepted: 26 December 2014

Published Online: January 2015

#### Key words:

*Strongyloides stercoralis*,  
corticosteroids, asthma,  
strongyloides hyperinfection,  
temperate region.

#### \*Corresponding Author

Dr. Gulnaz Bashir.

### Abstract

The autoinfective larvae of *Strongyloides stercoralis* cause hyperinfection in immunocompromised hosts. We report a case of hyperinfection with *Strongyloides stercoralis* in an asthmatic patient on corticosteroids presenting with cough, expectoration, abdominal pain and loose motions. Larvae were detected in Gram stained sputum smears, stool and duodenal aspirates. Duodenal aspirates also revealed adult worms laden with eggs. The patient responded to treatment with ivermectin. We believe this is the first report of hyperinfection with *Strongyloides stercoralis* from Kashmir, India located in a temperate area.

Copy Right, IJAR, 2015,. All rights reserved

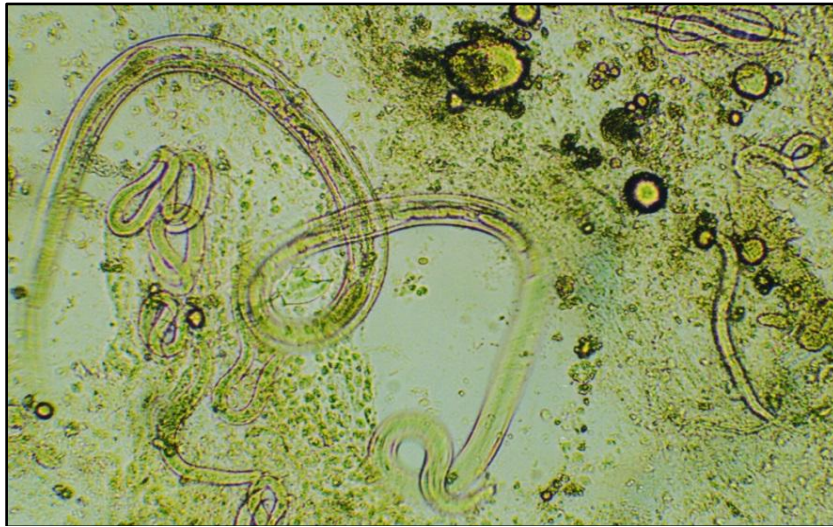
## INTRODUCTION

Strongyloidiasis is caused by infection with *Strongyloides stercoralis*, a parasite endemic to tropical and subtropical climates throughout the world (IgraSiegman Y et al., 1981). Though, the exact prevalence of strongyloidiasis in India is not known, the incidence has been reported as less than 1% in Indian populates with heavy parasitic infestations. (Kang G et al., 1998; Subbannayya K et al., 1989). The infection is mostly asymptomatic, (Vadlamudi RS et al., 2006) however, in the setting of severe immunosuppression the worm may disseminate, causing hyperinfection or dissemination (Vijayan VK, 2007; Segarra-Newnham M., 2007). Hyperinfection syndrome occurs in 1.5 to 2.5% of the patients with strongyloidiasis (Vadlamudi RS et al., 2006). We report a non-fatal case of *Strongyloides* hyperinfection from Kashmir, a temperate region in India, triggered by steroid intake.

## CASE HISTORY

A 70 years old male, normotensive, diabetic on insulin, asthmatic for last 10 years on bronchodilators, was put on oral steroids in the form of prednisolone (60 mg/d) 3 months back, for relief of asthma. Initially patient reported improvement and steroids were tapered to 5mg O.D but later on developed cough with expectoration, pain upper abdomen and loose motions. Pain was of burning type associated with nausea with no relieving factors. He passed 3-4 motions /day which were semi-solid in

consistency, not blood tinged. There was no H/O urticaria. Patient belonged to Kashmir a temperate region and denied any travel outside his native place since birth. He was hospitalized in January 2006 and physical examination revealed generalized wasting and pallor. Pulse was 84/min, respiratory rate 24/min, BP 120/70 mm Hg, JVP normal. There was no lymphadenopathy, edema, icterus, cyanosis or clubbing. Chest, CVS and CNS examination were within normal limits. Abdominal examination revealed a scaphoid, tender abdomen with normal bowel sounds. Investigations revealed Hb; 10.9 gm/dL, MVC; 84.4fl, TLC;  $10.9 \times 10^9/L$ , DLC; P 80%, L 13%, M 6% E 1%, PLT;  $206 \times 10^9/L$ , urea; 92mg/dL, creatinine; 1.5mg/dL. CXR revealed prominent bronchovascular markings. USG abdomen revealed cholelithiasis and Grade II prostatomegaly.

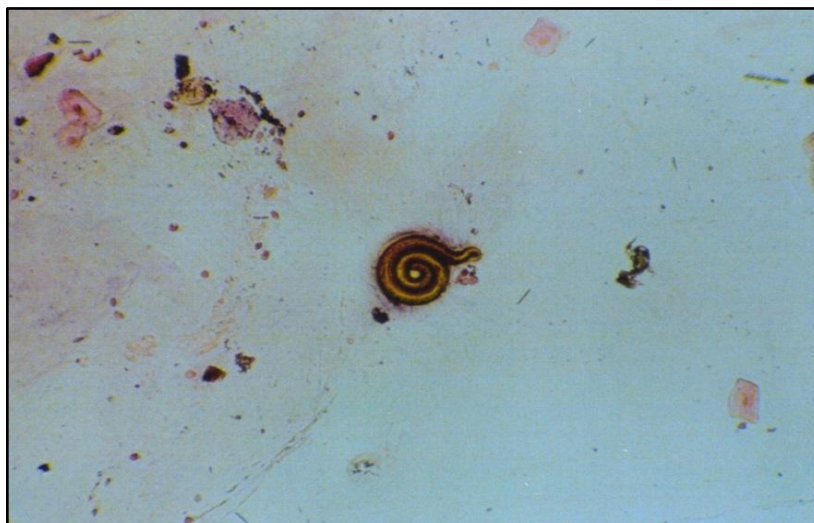


**Fig-1: Photomicrograph of wet mount of duodenal aspirate showing numerous larvae and gravid female of *Strongyloides stercoralis*. (400X)**

Upper GI endoscopy was done which revealed a normal study. Examination of duodenal aspirate demonstrated numerous larvae and gravid female of *Strongyloides stercoralis* (Fig-1). Stool examination revealed larvae of *Strongyloides stercoralis* and pus cells. Many slender larvae of *Strongyloides stercoralis* were seen in Gram smear of sputum (Fig-2). All these features were consistent with Strongyloides hyperinfection syndrome. Patient was given oral ivermectin ( $200\mu\text{g/kg/day}$ ) for 2 days. Subsequent course was uneventful. Repeat examination of sputum and stool on fourth and fifth day was negative for *Strongyloides* larvae and he was discharged.

## DISCUSSION

*Strongyloides stercoralis* is a nematode parasite and exists in three forms: adult, filariform larvae, and rhabditiform larvae. The infective filariform larvae, after penetrating the human skin, migrate to the lungs to mature into rhabditiform larvae. Larvae propelled to the pharynx are swallowed and mature into adults in the small intestine. Eggs hatch into rhabditiform larvae which are either excreted into the stool or become filariform larvae and automatically infect their host by penetrating the intestine and migrating to



**Fig- 2: Photomicrograph of Gram smear of sputum showing larva of *Strongyloides stercoralis* and squamous epithelial cells. (100X)**

the lungs. (Chu E et al.,1990; Lim S et al.,2004). Strongyloides hyperinfection occurs when impaired immunity allows many *Strongyloides* filariform larvae to accumulate in the lungs. (Chu E et al.,1990; Newberry AM et al., 2005). In our case, larvae were seen in sputum and stool while gravid female nematodes with larvae were simultaneously seen in the duodenal aspirate suggesting hyperinfection.

Immunosuppression either iatrogenic e.g. use of systemic corticosteroids or due to intercurrent illness such as HTLV-1 and HIV infection, organ transplantation, and other infectious diseases like kalaazar can increase the risk of hyperinfection syndrome in patients with strongyloidiasis. (Vadlamudi RS et al., 2006). The administration of corticosteroids is previously reported to be the most common single cause of the hyperinfection syndrome. It has been speculated that corticosteroid metabolites, accumulating during therapy and competing for the antibody binding site, may activate receptors for ecdysteroids on the parasites which are important in the parasite development, indicating that steroids could be the important *Strongyloides stercoralis* biomass controllers (Suvajdzic N et al., 1999). Our patient developed Strongyloides hyperinfection syndrome after corticosteroid therapy for acute exacerbation of asthma.

Eosinophilia which may be present in 50-92% of chronic asymptomatic patients is usually absent in hyperinfection (Davidson RA, 1992; Genta RM, 1989; Bruno P et al., 1982) as seen in our patient. The mortality rate of Strongyloides hyperinfection is 61% to 85% unless diagnosed early and treated appropriately (Chu E et al.,1990; Lim S et al.,2004; Newberry AM et al., 2005). Strongyloides hyperinfection can be treated with albendazole or ivermectin, or both if the patient is immunosuppressed, until sputum is negative for *Strongyloides* larvae (Lim S et al., 2004). Our patient responded very well to ivermectin treatment and had no life threatening complication. Stool and sputum became negative before patient was discharged. Most of the reports of strongyloidiasis are from tropical and subtropical areas (IgraSiegman Y et al., 1981) however, our case with no history of travel to any highly endemic area suggests the acquisition of *Strongyloides stercoralis* indigenously in a temperate area.

To conclude, although *Strongyloides* hyperinfection is extremely uncommon, the potential severity of this syndrome points to the fact that even in non-endemic areas the awareness of the disease among clinicians and microbiologists is essential and should be considered as a possible etiology in asthma unresponsive to or paradoxically made worse by steroid therapy and in patients with co-existing abdominal and respiratory symptoms.

## REFERENCES

1. Bruno, P., Mc Allister, K., Mathew, J. (1982): Pulmonary strongyloidiasis. *South Med J.*, 75: 363-5.
2. Chu, E., Whitlock, W.L., Dietrich, R.A. (1990): Pulmonary hyperinfection syndrome with *Strongyloides stercoralis*. *Chest.*, 97:1475-1477.
3. Davidson, R.A. (1992): Infection due to *Strongyloides* in patient with pulmonary disease. *South Med J.*, 85:28-31.
4. Genta, R.M. (1989): Global prevalence of Strongyloidiasis critical review with epidemiologic insights into the prevention of disseminated disease. *Rev Inf Dis.*, 2:755-67.
5. IgraSiegman, Y., Kapila, R., Sen, P., Kaminiski, Z.C., Louria, D.B. (1981). Syndrome of hyperinfection with *Strongyloides stercoralis*. *Rev Infect Dis.*, 3:397-407.
6. Kang, G., Mathew, M.S., Rajan, D.P., Daniel, J.D., Mathan, M.M., Mathew, V.I., et al. (1998). Prevalence of intestinal parasites in rural Southern Indians. *Trop Med Int Health.*, 3:70-5.
7. Lim, S., Katz, K., Krajden, S., Fuksa, M., Keystone J.S., Kain, K.C. (2004). Complicated and fatal *Strongyloides* infection in Canadians: risk factors, diagnosis and management. *CMAJ.*, 171: 479-84.
8. Newberry, A.M., Williams, D.N., Stauffer, W.M., Boulware, D.R., Hendel-Paterson, B.R., Walker, P.F. (2005). *Strongyloides* hyperinfection presenting as acute respiratory failure and Gram- negative sepsis. *Chest.*, 128: 3681-4.
9. Segarra-Newnham, M. (2007). Manifestations, diagnosis and treatment of *Strongyloides Stercoralis* infection. *Ann Pharmacother.*, 41:1992-2001.
10. Subbannayya, K., Babu, N.M., Kumar, A., Roats Shivananda, P.G. (1989). *Entamoeba histolytica* and other parasitic infections in South Kanara district, Karnataka. *J Commun Dis.*, 21:207-13.
11. Suvajdzic, N., Kranjčić-Zec, I., Jovanović, V., Popović, D., Colović, M. (1999). Fatal strongyloidosis following corticosteroid therapy in a patient with chronic idiopathic thrombocytopenia. *Haematologia.*, 29:323-6.
12. Vadlamudi, R.S., Chi, D.S., Krishnaswamy, G. (2006). Intestinal strongyloidiasis and hyperinfection syndrome. *Clinical and Molecular Allergy.*, 4: 1476-7961.
13. Vijayan, V.K. (2007). How to diagnose and manage common parasitic pneumonias. *Curr Opin Pulm Med.*, 13:218-24.