

IMMUNOCOMPROMISED STATUS A CAUSE OF OPPORTUNISTIC INTESTINAL INFECTION LEADING TO GRAM NEGATIVE SEPSIS

Rekha Rai¹, Vimal Kumar Karnaker¹, Krishnaprasad M.S², Ganesh H.R.³

¹Associate Professor, Department of Microbiology, K.S. Hegde Medical Academy,

²Professor & HOD Department of Microbiology, K.S. Hegde Medical Academy

³Lecturer, Department of Microbiology, K.S. Hegde Medical Academy

Correspondence:

Rekha Rai

Associate Professor, Department of Microbiology, K.S. Hegde Medical Academy, Deralakatte, Mangalore - 575018. Mobile No : 94803 66683 E-mail : rairekharai@rediffmail.com

Abstract:

Gram negative sepsis and intestinal opportunistic infections including *Cryptosporidium*, *Isospora*, *Cyclospora*, *Microsporidia*, *S.stercoralis* and *Candida albicans* are increasingly becoming prevalent in acquired immunodeficiency syndrome (AIDS) patients. These infections are clinically important primarily because many of these have the potential for serious and even lethal complications in immunosuppressed patients. Here, we are reporting a patient with Gram-negative sepsis, who was found to be co-infected with three of these opportunistic pathogens. She was also found to be positive for human immunodeficiency virus (HIV) antibodies. To our knowledge, this has been reported once previously, and serves as a reminder to actively exclude *S.stercoralis* infection in immunocompromised individuals presenting with bacteraemia.

Introduction *Strongyloides stercoralis* is an intestinal nematode of humans. It has a worldwide geographical distribution but is endemic in the tropics and the subtropical regions of the world. It is estimated that tens of millions of persons are infected worldwide, although no precise estimate is available. *Strongyloidiasis* in an immunocompetent host is an indolent disease, but in an immunocompromised host the overwhelming accelerated autoinfection cycle can potentially lead to life threatening illness with multi organ failure due to massive larval invasion known as hyper infective syndrome^[1]. The hyperinfective state is associated with massive invasion of the gastrointestinal and respiratory systems and may result in widespread dissemination into other body organs or invasive *strongyloidiasis*.

Case report

A thirty five year old lady with unknown HIV status, was admitted in the medicine department of K.S.Hegde Medical Academy, Mangalore, with complaints of loose stools of 4-5 episodes per day, weight loss and low

grade fever on and off for more than three months duration. She gave history of recent aggravation of symptoms, with high fever and chills for 2 days. Blood and stool samples of the patient received by the microbiology department were subjected to standard diagnostic microbiological examination.

Two of the three blood cultures revealed the presence of *E. coli* which was identified by standard biochemical reactions. The stool sample was concentrated by formol-ether concentration technique. A wet mount preparation revealed numerous larvae of *Strongyloides stercoralis* and moderate number of yeast like budding cells. Gram smear revealed moderate number of gram positive yeast like budding cells with pseudohyphae. Z-N stained smear did not reveal any acid fast bacilli. A smear stained by modified Z-N staining method revealed a large number of round pink cysts of *Cryptosporidium parvum* measuring 4-6 µm in diameter. However, gastric aspirate and sputum were found negative for larvae of *S. stercoralis*.

The stool sample was also inoculated on the plates of MacConkey agar, nutrient agar, and XLD. No pathogenic bacteria were isolated. Thus, the role of bacteria which may cause chronic diarrhea, were ruled out. However, culture on SDA revealed colonies of *Candida* species which was subjected to confirmatory tests and identified as *Candida albicans*. She was also found to be positive for human immunodeficiency virus (HIV) antibodies.

Discussion

Although most infected individuals are asymptomatic, *Strongyloides stercoralis* is capable of transforming into a fulminant fatal illness under certain conditions that are associated with an immunocompromised host such as patients on steroid therapy, those infected with human T cell lymphotropic virus-1 (HTLV-1) and Human immunodeficiency virus (HIV).⁽²⁾ The isolation of *Cryptosporidium* in stools of HIV-infected patients from different developing countries yielded prevalence rates of 6% to 94% and that of *C. albicans* was 7.6% to 39.1%.⁽³⁾ *Strongyloides stercoralis* causes heavy infection in AIDS patients with prevalence of about 2.5%. Co-infections with *Cryptosporidium* and *S. stercoralis* have been reported from AIDS patients.⁽⁴⁾ *Strongyloides stercoralis* is an important human parasitic infection primarily because of its potential for serious and even lethal disease in immunosuppressed patients. In the present case, Strongyloidiasis might be responsible for gram negative sepsis as intestinal flora attached to the larvae, during invasion, may also migrate throughout the body^[5]. To our knowledge, gram negative bacterial sepsis in an immunocompromised patient associated with gastrointestinal *Strongyloides stercoralis*, has been reported once previously and serves as a reminder to actively exclude *S. stercoralis* infection in immunocompromised individuals presenting with bacteraemia^[2].

Intestinal coccidial infection with *Cryptosporidium*, *Cyclospora*, *Isospora* and *Microsporidia* are increasingly

becoming prevalent in AIDS. Intestinal infection with *Cryptosporidium* is self limiting in immunocompetent individuals but leads to persistent diarrhea in advanced stage of AIDS. Yeast in stool specimen is due to transient or commensal growth in GIT. However in immunocompromised individuals it may lead to invasive disease thus proving to be a fatal opportunistic pathogen.^(3,4)

To conclude, we wish to emphasize that, patients with multiple opportunistic infections, especially Strongyloidiasis, are at a high risk of developing fatal gram negative sepsis- particularly when the patient is immunocompromised. Hence, early diagnosis and treatment of parasitic infections will help in improving the quality of life in AIDS patients.

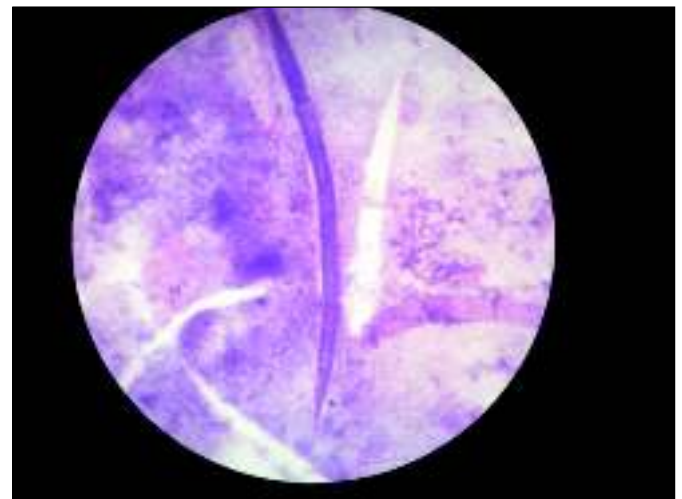


Fig 1: Larvae of *Strongyloides stercoralis*

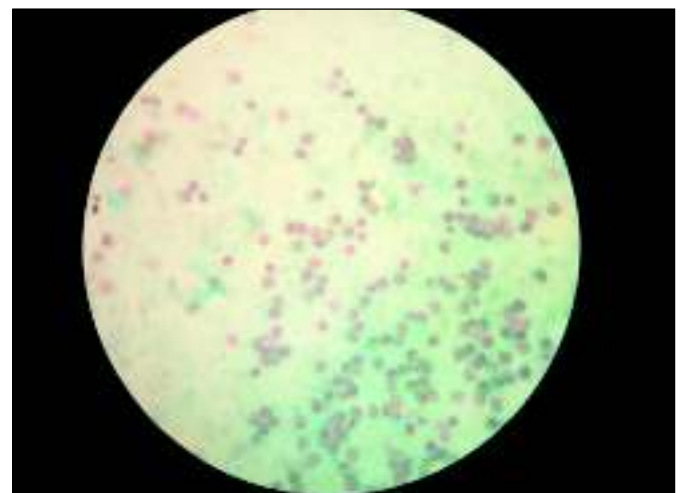


Fig 2: Cysts of *Cryptosporidium parvum*

References:

1. Feitosa G, Bandeira AC, Sampaio DP, Badaró R, Brites C. High prevalence of Giardiasis and Strongyloidiasis among HIV-infected patients in Bahia, Brazil. *Braz J Infect Dis* 2001; 5:339-344.
2. Fasih N, Irfan S, Sheikh U, Beg MS. A fatal case of gram negative bacterial sepsis associated with disseminated strongyloidiasis in an immunocompromised patient. *JPak Med Assoc* 2008; 58: 91-92.
3. Rossit AR, De Almeida MT, Nogueira CA, Oliveira JG, Barbosa DM, Moscardini AC. et al. Bacterial, yeast, parasitic, and viral enteropathogens in HIV-infected children from Sao Paulo State, Southeastern Brazil. *Diagn Microbiol Infect Dis* 2007; 57:59-66.
4. Shah UV, Purohit BC, Chandralekha D, Mapara MH. Coinfection with *Cryptosporidium*, *Isospora* and *S.stercoralis* in a patient with AIDS- A case report. *Indian J Med Microbiol* 2003; 21:137-8.
5. Salluh JI, Bozza FA, Pinto TS, Toscano L, Weller PF, Soares M. Cutaneous periumbilical purpura in disseminated strongyloidiasis in cancer patients, a pathognomonic feature of potentially lethal disease? *Braz J Infect Dis* 2005; 9:419-24.