



## Case Report

## Cryptosporidiosis in HIV patients: A case report for timely diagnosis and prompt intervention

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## ABSTRACT

Cryptosporidium is one of the major causes of diarrhea in HIV-positive patients. Infection is related to the ingestion of oocyst-contaminated drinking water or food. In HIV infected individuals, this infection could have a higher mortality and vary in clinical manifestation. We report a case of cryptosporidiosis in a recently detected HIV patient who was suffering from intermittent diarrhea for last 2 months. Stool samples were collected and examined by modified Kinyoun's acid fast staining. On microscopy of smear, we found pink, spherical oocyst 4-6 $\mu$ m in diameter. The absolute CD4+ count of patients was 85 cells/ $\mu$ l and viral load was 560 copies/ml. Patient was treated with an antiparasitic drug Nitazoxanide for 3 days and anti-retroviral Treatment started in ART clinic. On follow up there was resolution of symptoms and no complaints of intermittent diarrhea.

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## 1. Introduction

The acquired immunodeficiency syndrome (AIDS) epidemic, now in its third decade, has grown into a pandemic disease that threatens the whole human population. Globally, it is estimated that 4 million HIV patients have Cryptosporidium infection, out of a total of 36 million HIV-infected people.<sup>1</sup> The three opportunistic protozoa that are most frequently seen in AIDS patients are *Pneumocystis carinii*, *Toxoplasma gondii*, and *Cryptosporidium parvum*.<sup>2</sup> With an estimated 10% possibility of infection in developed countries, those who are HIV-positive run a high risk of having cryptosporidiosis.<sup>3</sup> Approximately 30% to 60% of AIDS patients in developed nations and 90% of patients in developing countries experience diarrhea.<sup>4</sup> Studies

conducted in India show that HIV patients' prevalence rates range from 11% to 33%, with rural areas having a prevalence rate of 39.7%.<sup>5</sup> The prevalence statistics are very erratic and could be a result of regional differences as well as variability among the studied population, particularly with regard to socioeconomic status and access to drinkable water. One of the diseases that characterize AIDS is cryptosporidiosis, which carries a higher mortality risk than the other diseases. The prevalence of this illness among AIDS patients has decreased with the introduction of highly active antiretroviral treatment (HAART).<sup>6</sup> Recurrence of Cryptosporidium species infection in HIV/AIDS patients has been linked to the establishment of drug-resistant HIV strains and the failure of HAART.<sup>7</sup> Upon consuming sporulated oocysts, it gets attached to enterocytes and proliferates through both sexual and asexual cycles, resulting in infection. Additionally, it is commonly connected to poor sanitary conditions and low levels of

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personal cleanliness in the populace and mostly spreads through ingestion of water tainted with human waste.<sup>8</sup>

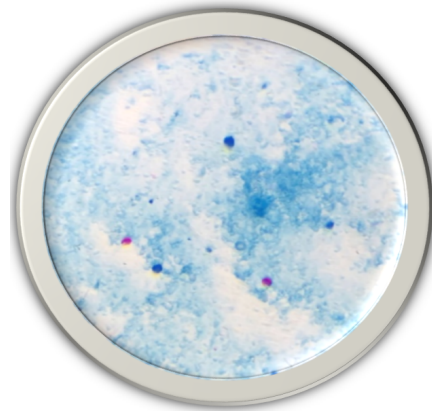
Many vertebrate hosts have *Cryptosporidium* species that infect the gastrointestinal epithelium at the microvillous boundary with a variety of clinical manifestations. Cryptosporidiosis is self-limiting in immunocompetent hosts, but it can cause severe malabsorption and recurrent diarrhea in immunodeficient animals.<sup>9</sup> Immunocompetent individuals may easily get rid of this parasite, however immunocompromised individuals may contract the illness and suffer from serious related morbidity and mortality. In AIDS patients, cryptosporidiosis can result in a serious condition that is marked by chronic, copious diarrhea. It is frequently profuse and fluid, generally not containing blood or leukocytes, and generally connected with weight loss. The result and the severity of the symptoms are frequently influenced by the host's immunological state. We are highlighting the key elements of a case of cryptosporidiosis in an HIV patient in this case report.

## 2. Case Report

A 30-year-old male patient admitted to a tertiary care facility in emergency department with complaints of loss of consciousness at work. Patient's relative give history of passage of loose stool intermittently for two months. He experienced up to 3-4 episodes of non-bloody watery diarrhea per day. Patient's relative also complaint of reduced appetite and weight loss of about 10 kg in a year. Patient had a rash on their thighs and shoulders five months prior. The rash was extremely itchy and left a scar after healing. The patient had a history of intermittent fever for the previous two years that was persistent in nature, not accompanied by chills or rigor. Additionally, patients had a history of oral and esophageal ulcers that were painful and were treated with medication one year prior.

Their blood sample was submitted to the biochemistry, pathology, and microbiology labs for regular testing at the emergency room. The laboratory work-up revealed white blood cell count: 10,200 cells/mm<sup>3</sup> with 46% neutrophils, 41% lymphocytes, 10% monocytes, 1% eosinophils; hemoglobin: 13.3 g/dL; platelets: 377,000/mm<sup>3</sup>, and the liver and kidney functions were within normal limits. In Microbiology laboratory his HIV ELISA was found to be reactive. Since patient previously had not known whether he was HIV positive, counselling was provided, and a second blood sample was sent to ART Clinic (Antiretroviral Therapy Clinic) for testing of the absolute CD4+ count using flow cytometry and viral load. A stool sample was collected, which were subjected to laboratory techniques in the following order: wet mount and modified Kinyoun's acid fast stain staining. In wet mount no pus cells, RBC, ova, cyst and trophozoite were seen. After formalin-Ether concentration technique smear was prepared and stained by modified Kinyoun's acid fast stain and seen under 100X

oil immersion. In microscopy, pink, spherical oocyst with 4-6µm in diameter were seen. There absolute CD4+ count was 85/mm<sup>3</sup> and viral load was 560 copies/ml. Patient was treated with an antiparasitic drug Nitazoxanide 500mg bd orally for 3 days and Anti-retroviral Treatment started in ART clinic. On follow up there was resolution of symptoms and no complaints of intermittent diarrhea. Oocysts were no longer detected in stool using the modified Kinyoun's acid fast stain.



**Fig. 1:** Modified Kinyoun's staining showing *Cryptosporidium* oocyst

## 3. Discussion

The spread of *Cryptosporidium* and its tendency to cause massive diarrheal outbreaks are caused by a variety of causes. (i) *Cryptosporidium* can infect various species of mammals, domestic animals and farm animals, particularly calves, are frequently discovered to have it. (ii) There are several species in the *Cryptosporidium* genus, some of which can infect humans. (iii) The oocyst is incredibly durable and can maintain its contagiousness under moist conditions for a very long time. (iv) Infected individuals can excrete up to 10<sup>8</sup> oocysts each day, and the infectious dose is incredibly tiny.

Nearly 40% of AIDS fatalities have diarrhea, which is a leading cause of morbidity in HIV/AIDS patients.<sup>10</sup> Diarrhea brought on by opportunistic intestinal protozoa is a common problem in HIV-positive individuals. In patients with diarrhea, parasites were more prevalent than bacterial and fungal infections, according to an Indian study (58.3% vs. 29.17% and 12.50%, respectively).<sup>11</sup> According to case-control studies, persons with HIV had a 20-fold higher risk of getting infected with *Cryptosporidium*.<sup>12</sup> Therefore, in addition to having a higher risk of acquiring symptomatic disease and a higher likelihood of having more severe and persistent symptoms, people with HIV also have a higher risk of contracting *Cryptosporidium*. The CD4+ count and cryptosporidiosis severity are correlated. The

risk factors for parasitic diarrhea in Indian patients include CD4 levels below 200 cells/ $\mu$ l, a history of diarrhea, using public restrooms, having a lower socioeconomic class and level of education, living in slums, and being exposed to animals. Those with a CD4+ level of more than 180 cells/ $\mu$ l are not prone to severe disease or self-limiting disease, whereas those with a CD4+ count of less than 50 cells/ $\mu$ l are susceptible to a severe version of the illness.<sup>13</sup> The FDA has approved nitazoxanide for the treatment of Cryptosporidium, although it is only partially effective in individuals who are HIV-positive.<sup>14</sup> With the introduction of highly active antiretroviral medication, which results in enhanced CD4+ T-lymphocyte counts in immunocompromised persons, recovery and survival rates have been drastically improved.<sup>8</sup> Protease inhibitors appear to directly interfere with the parasite's life cycle, therefore using them with highly active antiretroviral therapy has extra benefits.<sup>15</sup>

Clinicians should examine early signs of cryptosporidiosis in HIV patients, such as diarrhea, in order to start therapy as soon as possible. Additionally, patients should take prophylactic antiparasitic therapy if their CD4 count is less than 200 cells/ $\mu$ l. These steps could result in a reduction in morbidity, mortality, and transmission if properly applied.

#### 4. Conclusion

The severity of enteric infection in HIV patients further increases the cost burden of the disease in a developing nation like India. The patients typically come from low socioeconomic backgrounds and struggle to pay for their medical care. Since AIDS frequently manifests itself fulminant, it is advised that measures be taken to prevent the emergence of these disorders in AIDS patients.

#### 5. Conflict of Interest

None.

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