

## Prevalance of Cryptosporidium Among HIV Positive Patients



### Medical Science

**KEYWORDS :** HIV, Cryptosporidium, Immunocompromise

**Dr. Joshi Tejal Kiritbhai**

Tutor, Department Of Microbiology P. D. U. Medical College, Rajkot

**Dr. Antala Sejukumar Kantilal**

Assistant Professor, Department Of Microbiology P. D. U. Medical College, Rajkot

### ABSTRACT

*This study is undertaken to determine prevalence rate of Cryptosporidium among Human Immunodeficiency Virus (HIV) positive cases. Stool sample from 100 HIV positive cases were collected. These cases were confirmed HIV-1 positive cases as per Strategy III of National AIDS control organization. Stool samples was examined by wet saline and iodine preparations, Modified acid fast staining for pink to deep red cryptosporidium oocysts. Out of 100 samples prevalence of Cryptosporidium oocyst is 12 %. Percentage of detection of Cryptosporidium oocysts was higher in male i.e. 14.71 % as compare to female i.e. 06.25 %. This study suggests infection of gastrointestinal tract with Cryptosporidium is highly prevalent among HIV positive person.*

### INTRODUCTION

Human Immunodeficiency Virus (HIV) causes acquired Immunodeficiency Syndrome (AIDS). It is a serious disorder of the immune system in which the body's normal defenses against infection break down, leaving it vulnerable to a host of life-threatening infections.

The retroviruses are RNA viruses; they were so named because they contain an enzyme that transcribes RNA into DNA1. The body fluids responsible for the transmission of the infection are blood, semen and vaginal fluid of an HIV infected person.2

As such parasitic diarrhoeas are an important cause of morbidity in developing countries, some of the parasites are well established enteric pathogens e.g. Entamoeba histolytica, Giardia lamblia and Balantidium coli etc. and others are opportunistic pathogens e.g. Cryptosporidium, Isospora, Microsporidium and Cyclospora etc. Only a small percent of individuals harboring the established enteric pathogenic parasites suffer from symptomatic disease in an immunocompetent host. However with advent of HIV/AIDS, the scenario has changed. The rate of infection with a particular enteric parasite in HIV/AIDS patient will depend upon the endemicity of the particular parasite in the community.

The progressive destruction of the immune system by chronic HIV infection leading to progressive fall in level of CD4 cells (<200 to <50) is responsible for the occurrence of infections by opportunistic microorganisms. Chronic parasitic gastrointestinal infections mainly diarrheas have been reported in developing countries. Protozoa are the most common cause in developing countries.

Most common enteric opportunistic parasites which have been associated with HIV/AIDS include,3-9 Cryptosporidium spp., Isospora belli, Cyclospora spp., Microsporidium spp., Strongyloides stercoralis, Giardia lamblia, Entamoeba histolytica

Diagnosis and surveillance of these opportunistic infections in AIDS will lead to early, accurate treatment and better management of these cases. Prophylaxis against some of these infections will prolong and improve quality of the life of an HIV infected individual. So an early and accurate diagnosis of the aetiological agent is important.<sup>10</sup>

Many species of Cryptosporidium exist that infect humans and a wide range of animals. Cryptosporidium parvum and Cryptosporidium hominis are the most prevalent species causing disease in humans, infections by C. felis, C. meleagridis, C. canis, and C. muris have also been reported. Cryptosporidium parvum and C. hominis occurs mainly through fecal-oral transmission.<sup>8,9</sup>

Infection results in wide range of manifestations, from asymptomatic infections to severe, life-threatening illness. Watery diarrhea is the most frequent symptom. In immunocompetent persons, symptoms are usually short lived (1 to 2 weeks); they can be chronic and more severe in immunocompromised patients,

especially those with CD4 counts <200/μl. Small intestine is the most commonly affected, symptomatic Cryptosporidium infections have also been found in other digestive tract organs, the lungs, and conjunctiva.

### MATERIAL & METHODS

Stool samples from HIV positive cases were collected in sterile wide mouth screw cap container. Colour, Consistency (formed, semi-formed, liquid), Presence of blood, mucus and / or pus, Presence of segments and /or worms are noted during examination of faecal specimen.

Stool was examined with low power and high power in wet slide preparations of Saline to demonstrate worm eggs, larvae, protozoal trophozoites, RBCs, WBCs and Iodine to stain glycogen and the nuclei of cysts. Stool was also examined under high power and oil immersion lens after Modified acid fast staining for pink to deep red Cryptosporidium oocysts (round, 4-6 μm in diameter having a granular appearance) against a blue background.

If the number of cysts, eggs or larva is low in faeces, direct examination may not reveal them. Hence, the faeces is concentrated. Stool was concentrated when there was negative result on direct examination. it was concentrated by formal ether concentration technique.

### OBSERVATION & RESULTS

A total of 100 samples of stool from HIV positive patients were examined for Cryptosporidium oocysts.

**Table-1: Age wise distribution of HIV positive patients.**

Age (Years)	Male		Female	
	Number	%	Number	%
< 20	0	00.00	0	00.00
20-30	46	67.65	21	65.63
30-40	17	25.00	11	34.37
40-50	5	07.35	0	00.00
> 50	0	00.00	0	00.00
TOTAL	68		32	

**Table-2: Occupation wise distribution of HIV positive patients.**

Occupation	Male		Female	
	Number	%	Number	%
Non Working	0	00.00	19	59.38
Labourer	54	79.41	9	28.13
Service	7	10.29	4	12.49
Driver	4	05.88	0	00.00
Diamond Worker	3	04.42	0	00.00
TOTAL	68		32	

Among occupation of HIV positive male patients 79.41 % were labourers, 10.29 % were having job, 05.88 % were drivers, 04.42 % were diamond worker. While for female patients 59.38 % were non-working, 28.13 % were labourer, 4% were doing jobs.

**Table-3: Cryptosporidium oocysts isolated in HIV positive patients**

Gender	Cryptosporidium	
	Number	%
Male	10	14.71
Female	02	06.25
Total	12	12

Percentage of detection of Cryptosporidium oocysts was higher in male i.e. 14.71 % as compare to female i.e. 06.25 %.

### DISCUSSION & CONCLUSION

HIV is no longer a rare infection now. India has a population of one billion, around half of who are adults in the sexually active age group.

Infections of the gastrointestinal tract are common in patients with AIDS. It has been estimated that 30-50% of patients with AIDS in the USA and about 90% in Africa and Haiti suffer from chronic diarrhea.<sup>11,12</sup> The impact of some relatively new spore/oocyst-forming intestinal protozoa, such as Cryptosporidium, Cyclospora, Microsporidia, and Isospora, on patients with AIDS is severe.<sup>13</sup> Infections caused by these parasites cannot be differentiated clinically unless specific faecal examination is carried out. The isolation rates of intestinal parasites in patients with AIDS and chronic diarrhoea vary from 40% to 83%<sup>14,15</sup>.

Patients with some type of immunocompromised condition and those submitted to immunosuppressive therapy have an increased probability of acquiring

parasitic infections, generally with a high degree of severity.<sup>16-20</sup> The intestinal mucosa organised in the Peyer's patches and immunoglobulin-secreting plasma cells present important natural barriers.<sup>21</sup> Activated B cells also produce and secrete IgA that impedes the adhesion of extracellular parasites.<sup>17</sup> Intracellular parasites are controlled by T helper type 1 lymphocytes (LT1)<sup>22,23</sup>.

In the present study, the majority of the patients (95%) were in the reproductive age group and there was a male preponderance (63%). This observation matches with the findings of other workers and trends shown by NACO<sup>24,25</sup>. 58% patients in the present study were hospitalised. This reflects the compromise of the immune status of these patients. The clinical profile seen in the present study is consistent with that reported by Ayyagari et al<sup>26</sup> and Talib and Singh<sup>25</sup>.

Hundred HIV positive patients were included in the study. In our study there were 68% male and 32% female. In both male and female age distribution shows that the number of patients were higher in reproductive age group. Among occupation of HIV positive male patients 63 % were laborers that suggests that in this region it is common in laborers. Prevalence of Cryptosporidium in the study population was 12%. Percentage of detection of Cryptosporidium oocysts was higher in male i.e. 14.71 % as compare to female i.e. 06.25 %.

This study suggests infection of gastrointestinal tract with Cryptosporidium is highly prevalent among HIV positive person. We believe our data could help health professionals to deal better with HIV infected patients and reinforces the need of prevention of opportunistic infection, a one of the major cause of morbidity and mortality in HIV positive patients.

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