

Spectrum Of Opportunistic Infections In Human Immunodeficiency Virus Infected Patients

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Abstracts: Background & Objectives: Opportunistic infections are common complication seen in HIV infected patients. The type of pathogens responsible for OIs varies from country to country and even from region to region within the same country. Therefore it is important to know the relative frequencies of specific OIs in different parts of the country for appropriate management strategies. This study was designed with an aim to document the pattern of opportunistic infections in HIV infected patients. **Methods:** The study included 152 HIV positive patients. Depending on the patient's clinical features, specimens were collected and processed as per standard microbiological protocol for demonstration or isolation of pathogens. **Results:** In the present study, out of 152 HIV infected patients, 92(60.5%) were males and 60(39.5%) were females. Opportunistic infections were noted in 106 (69.7%) patients. *Mycobacterium tuberculosis* was the most common bacterial pathogen. *Cryptosporidium parvum* followed by *Iso spora belli* and *Entamoeba histolytica* were the major parasites demonstrated in stool of HIV infected patients. *Candida* spp. was the predominant mycotic pathogen. **Conclusion:** In HIV infection opportunistic infections account for a considerable proportion of mortality and morbidity. It also necessitates toxic and expensive therapies. The early diagnosis and adequate management of opportunistic infections can slow down the progression to AIDS and need for antiretroviral therapy. [Aher C NJIRM 2014; 5(3) :22-26]

Key Words: : Coccidian parasites HIV infection, opportunistic infections, oropharyngeal candidiasis

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Introduction: The advent of HIV has entirely altered the incidence and prevalence of infections. The vulnerability on the part of the host's immune system is aptly availed to the fullest by various opportunistic microorganisms.

Opportunistic infections (OIs) are common complication seen in HIV infected patients. In HIV infection OIs account for a considerable proportion of mortality and morbidity. It also necessitates toxic and expensive therapies.¹

The incidence of OIs depends on the level of immunosuppression and on the endemic prevalence of the pathogen.² The organism causing OIs usually cause asymptomatic or mildly symptomatic, self limiting infections in immunocompetent individuals whereas, in HIV infected patients these infections may be severe or even life threatening.³

The type of pathogens responsible for OIs varies from country to country and even from region to region within the same country.⁴ Therefore it is important to know the relative frequencies of

specific OIs in different parts of the country for appropriate management strategies.

The present study was conducted with an aim to document the pattern of bacterial, fungal and parasitic OIs in HIV infected individuals. The viral cultures were not performed due to lack of facilities.

Material and Methods: A descriptive retrospective study was conducted, involving 152 HIV positive patients. The protocol of the study was approved by the institutional ethics committee.

HIV seropositive patients were defined as those who had been tested positive for HIV antibodies by any of the two tests i.e. ELISA/Rapid/Simple as per the WHO recommendation.⁵

Depending on the patient's clinical features, samples were collected which included stool, sputum (three sputa specimen-first spot, early morning and second spot), cerebrospinal fluid, lymph node aspirate, oral swab, blood and urine.

The separate smears were prepared from all the sputum samples on clean, new and grease free slide and stained by Ziehl- Neelsen staining method. Diagnosis of tuberculosis was made strictly following the guidelines of Revised National Tuberculosis Control Programme (RNTCP).⁶ Sputum sample was also inoculated on Lowenstein Jensen's media. Giemsa stained smear of sputum sample was examined for detection of *Pneumocystis jiroveci*.

Stool samples were collected according to the WHO standard procedures and examined microscopically.⁷ Saline wet mount was prepared for demonstration of trophozoites, larvae and to distinguish between bile stained and non bile stained eggs of helminths. Lugol's iodine mount supplemented the detection of cysts of intestinal parasites. Smears from stool samples were also stained by modified acid fast staining detection of coccidian parasites like *Cryptosporidium parvum*, *Isospora belli* and *Cyclospora*. Stool culture was done to isolate Salmonella and shigella.⁸

Oral swab collected from the suspected cases of oropharyngeal candidiasis (OPC) was inoculated on Sabouraud dextrose agar (SDA). The species identification of *Candida* was done on the basis of germ tube test and colony colour on HiCHROM agar.

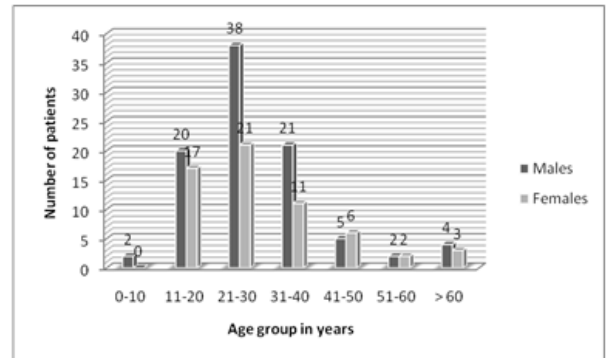
Cryptococcal meningitis was diagnosed by India ink preparation of CSF and by culture on SDA.

Specimens were also inoculated on different media like blood agar, Macconkey's agar and chocolate agar for isolation of various bacterial pathogens. Identification of microorganisms was done following the standard microbiological profile⁴.

Result: In the present study out of 152 HIV infected patients, 92(60.5%) were males and 60(39.5%) were females.

Figure 1 shows age and sex wise distribution of HIV infected patients. In male patients the incidence of HIV was more in age group 21-30 years followed by 31-40 years whereas in females it was 21-30 years followed by 11-20 years.

Figure 1: Age And Sex Wise Distribution Of Hiv Infected Patients



The patients usually presented with more than one complaint.

Table1: Distribution Of Major Clinical Features

Clinical Features	No. Of Patients
Cough	98
Weight loss	63
Fever	59
Diarrhoea	57
Generalised lymphadenopathy	28
Lesions In The Mouth	21

Table 1 shows the distribution of major clinical features. Cough followed by weight loss and fever were the major clinical features of patients with HIV infection.

Opportunistic infections were noted in 106 (69.7%) patients.

Table 2: Sample Wise Distribution Of Bacterial Pathogens.

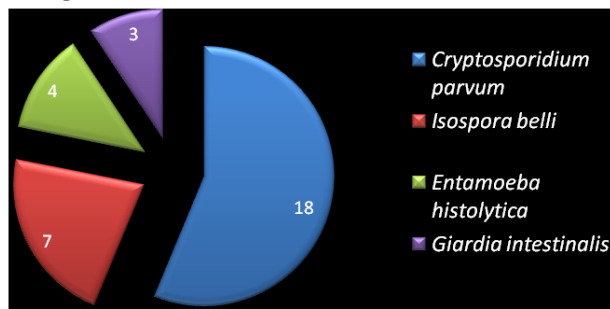
Bacterial pathogen	Specimen	Number of isolates
<i>Mycobacterium tuberculosis</i>	sputum	26
<i>Streptococcus pneumoniae</i>	sputum	07
<i>Klebsiella pneumoniae</i>	sputum	05
<i>Staphylococcus aureus</i>	sputum	07
<i>Escherichia coli</i>	urine	04
<i>Pseudomonas aeruginosa</i>	blood	03

Table 2 shows the details of bacterial pathogens isolated from various clinical specimens. Bacterial

infections were noted in 52 patients. *Mycobacterium tuberculosis* was the most common bacterial pathogen followed by *Streptococcus pneumoniae* and *Staphylococcus aureus*.

Intestinal parasitic infection was noted in 32 patients. *Cryptosporidium parvum* followed by *Isoospora belli* and *Entamoeba histolytica* were the major parasites demonstrated in stool of HIV infected patients .

Figure 2: Distribution Of Intestinal Parasites



Opportunistic mycoses were seen in 22 patients. Details of fungal pathogens isolated from HIV infected patients is shown in table 3. *Candida* spp. was the predominant mycotic pathogen. Out of 18 *Candida* spp. isolated from oral lesions 10 were non albicans *Candida* (NAC) spp., whereas 8 were identified as *C. albicans*. Among NAC spp. *C. glabrata* was the most common isolate followed by *C. tropicalis*. *C. dubliniensis* was isolated from 2 cases.

Table 3: Sample Wise Distribution Of Fungal Pathogens

Fungal pathogen	Specimen	Number of isolates
<i>Candida</i> spp.	Oral swab	18
<i>Cryptococcus neoformans</i>	CSF	03
<i>Aspergillus niger</i>	Sputum	01

Discussion: In HIV infection the continuous impairment of immune system, makes the patients vulnerable to various common and opportunistic infections. ⁹ India is estimated to have the third largest HIV infected population in the world. ¹⁰ Despite the widespread HIV awareness

programmes which are going on at present, a large number of patients either go undiagnosed or present late with multiple infections. ¹⁰

In our study, the incidence of HIV was more in males as compared to females. Male predominance was also noted in studies of other researchers like Srirangaraj et al ¹, Ayyagari et al ³, Deorukhkar et al ⁴ and Kumarswamy et al. ¹¹ HIV infection was more common in young age group which is in accordance to various national and international reports. As the infection is more in this age group, the overall economic burden on the country is increased. ¹

In the present study cough, weight loss, fever and diarrhoea were the most common clinical features in HIV infected patients. Our observation is similar to that of Deorukhkar et al. ⁴ *M. tuberculosis* was the most pathogen isolated from HIV infected patients. Similar findings were reported from other studies conducted in different parts of the country. ^{1,4,12} Our observation also supports that tuberculosis is one of the most common OIs in HIV infected population of India. In HIV infected patients, active tuberculosis infection also promotes host HIV replication and progression to AIDS. ² Therefore it is very important to institute appropriate TB control measures on a large scale all over India. ¹

Bacterial pneumonias are also common causes of HIV- related morbidity. They may occur even with relatively higher CD4 counts. ² In our study *S. pneumoniae* and *S. aureus* were other bacteria isolated from the sputum of the HIV positive patients presenting with cough and fever. The clinical manifestations of bacterial pneumonia in HIV infected individuals are the same as in those without HIV, but they occur at a higher frequency and have higher complication rates. ² Such complications include bacteraemia, intrapulmonary cavitation, abscess, empyema and death. ² As per the figures from National AIDS Control Organization (NACO), bacterial infections constituted 7% of OIS and the common organisms encountered are *S. aureus*, *S. pneumoniae* and *H. influenzae*. ¹³

Diarrhoea is among the most common symptoms of HIV infection and is experienced by over 90% of AIDS patients.¹⁴ It becomes more frequent as immune deficiency progresses. In HIV infected patients, diarrhoea may be either acute (< 7 days) or chronic (three or more liquid stools daily for > 14 days).² Chronic diarrhoea leads to malabsorption, malnutrition and contributes to mortality.² Several intestinal protozoal species have been associated with acute and chronic diarrhoea in HIV infection. The most commonly reported include *Cryptosporidium parvum*, *Isoospora belli*, *Microsporidium* spp, *Giardia intestinalis*, *Entamoeba histolytica* and *Cyclospora* spp¹⁰. In our study coccidian parasites were the predominant intestinal parasites demonstrated in stool samples of HIV infected patients. Our observation is consistent with that of other researchers like Deorukhkar et al⁴, Gupta et al¹⁰ and Mohandas et al.¹⁵ Coccidian parasites usually cause a self-limiting illness in immunocompetent individuals but in HIV/AIDS they are known to cause life threatening profuse watery diarrhoea.¹⁰

Mycoses in general and candidiasis in particular are common in HIV infection. OPC is by far the earliest indicator of HIV infection. It occurs in up to 90% of HIV infected patients during the course of infection and is considered as important marker of the disease and its progression.¹⁶ Although OPC is not fatal but it may limit food consumption and lead to weight loss, threatening the general health and well being of HIV infected patients. In the present study incidence of OPC due to NAC spp. was higher than that of *C. albicans*. Many recent studies have documented a shift from *C. albicans* to NAC spp. as a cause of candidiasis including OPC.¹⁷ NAC spp. tends to be less susceptible to commonly used antifungal drugs, such as fluconazole.

Cryptococcus neoformans was isolated from CSF sample of 3 suspected cases of meningitis. Cryptococcal meningitis is the most common fungal meningitis in AIDS and affects about 10%.² The majority of cases are seen when the CD4+ counts are < 50 cells/mm³. It commonly presents as subacute meningitis or meningoencephalitis with fever, malaise and headache.² Classical symptoms and signs such as neck stiffness or

photophobia occur in one-fourth to one-third of AIDS patients.²

Conclusion: The rate of progression of an individual from HIV infection to AIDS depends on a number of viral and host factors including health status of person, type of risk behaviour, type and frequency of exposure to opportunistic infections, accessibility to drugs for prevention and management of opportunistic infections and access to antiretroviral therapy (ART). The profile of opportunistic infections varies from country to country depending on the infections already prevalent in the community. The early diagnosis and adequate management of opportunistic infections can slow down the progression to AIDS and need for ART.

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