

## ORIGINAL ARTICLE

# PREVALENCE OF OPPORTUNISTIC FUNGAL INFECTIONS IN HIV POSITIVE PATIENTS IN TERTIARY CARE HOSPITAL IN RAJKOT

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## ABSTRACT

**Introduction:** Human Immunodeficiency virus (HIV) is the most significant emerging infectious pathogen of the 20th century. The HIV/AIDS epidemic continues its expansion across the globe including India.

**Material and Method:** This study was conducted during June 2008 to August 2009. During this period samples from 100 HIV positive cases were collected. Different samples like sputum, CSF, oral swab, throat swab, vaginal swab, pus, skin scrapings were collected and examined for fungus by direct microscopy as well as for culture growth using Sabourauds dextrose medium. In direct microscopy Gram's staining, KOH wet mount and India ink preparation were used to observe the fungi. And for culture Sabourauds dextrose agar with and without chloramphenicol and blood agar were used.

**Result:** Among all patients, detection of Candida species was 55%, Cryptococcus neoformans was 4%, Aspergillus species was 3% and Dermatophytes was 4%. In our study there were 78% male and 22% female.

**Conclusion:** opportunistic fungal infections are highly prevalent in HIV positive patients. Our results are comparable with some of the studies conducted in India and abroad.

**Key words:** HIV, Opportunistic fungal infections, Candida, Cryptococcus, Aspergillus, Dermatophytes.

## INTRODUCTION

Human Immunodeficiency virus (HIV) is the most significant emerging infectious pathogen of the 20th century. Since the Acquired immunodeficiency syndrome was first recognized in 1981 from north America, the HIV/AIDS epidemic continues its expansion across the globe <sup>1,2</sup>.

India has an estimated 2.6 million infection making India the country with the 3rd largest population of HIV patients.

This condition (HIV) progressively reduces the effectiveness of the immune system and makes individuals susceptible to opportunistic infections & tumors. HIV is transmitted through direct contact of a mucous membrane or the blood stream with a Bodily fluid containing HIV such as blood, semen, vaginal fluid, pre-seminal fluid and breast milk<sup>3</sup>.

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.

There is a marked depression of cellular immunity. This often leads to several opportunistic infections including fungal infections. Studies on AIDS in the USA and Africa show that at least 50 to 90 percent of all patients contract a fungal infection at some time during the course of the illness and 10 to 20 percent die as a direct consequence of these infections<sup>4</sup>. The role of fungal infections became more important since *Pneumocystis jiroveci*, which previously thought to be a protozoan, has been classified as a fungus on the basis of genetic studies<sup>5</sup>.

The most common and some of the uncommon mycoses seen in patients of AIDS are Candidiasis,

Cryptococcosis, Histoplasmosis, Aspergillosis and Dermatophytes:<sup>6</sup> Other fungal infection that are also seen in HIV patient are Coccidioidomycosis, Blastomycosis, Penicilliosis & Sporotrichosis and Pneumocystis jiroveci (Pneumocystis carinii)

This study was conducted to know various opportunistic fungal infections prevalent in HIV positive patients at tertiary care hospital in Rajkot.

## MATERIAL & METHODS

Hundred HIV positive patients presenting to the Voluntary Counseling and Testing Centre, P.D.U Medical College, Rajkot, Gujarat and patients admitted in various medical wards were included in the study. This study was undertaken to determine opportunistic fungal infections among HIV positive cases attending P. D. U. Medical College & Hospital, Rajkot. Samples from 100 HIV positive cases were collected from June 2008 to August 2009. These patients were already tested for HIV as per Strategy III of National AIDS control organization by using 3 different system of testing to establish diagnosis of HIV<sup>3</sup>.

Different samples, based on the presentation, were collected for investigations. This includes following samples.

1. Sputum: collected in sterile wide mouth screw cap container
2. Oral swab: collected by using sterile cotton swab
3. CSF: collected in sterile syringe
4. Skin scraping
5. Pus
6. Vaginal swab: collected by using sterile cotton swab

### Microscopy, culture and identification:

Depending on the clinical symptoms, relevant clinical samples were collected with complete universal precautions and relevant methods were used for diagnosis and isolation, which included a battery of tests as per standard procedures. The samples were subjected to direct microscopy using Gram and Giemsa staining, KOH wet mounts, India ink preparations depending on the type of specimen and the suspected infection in the patient.

Fungal culture was done on Sabouraud dextrose agar, with and without chloramphenicol, brain heart infusion agar and blood agar. Specimens were streaked in duplicate; one set of inoculated slants was incubated at 25 °C and the other at 37 °C, and they were examined every other day for growth up to 4–6 weeks before discarding as negative. Samples inoculated on blood agar were incubated for 24–48 h and samples on brain heart infusion agar were incubated for 1–2 weeks.

Fungal growth was identified by colony morphology, Gram staining, lactophenol cotton blue preparation and slide culture as per standard recommended procedures. Identification & speciation of yeast isolates was done

on the basis of germ tube production and morphology on corn meal agar (HiMedia).

## RESULTS

A total of 100 HIV positive patients were examined for opportunistic fungal infection.

Samples were classified according to various age groups, sex, occupation and detection of various opportunistic fungi among male and female HIV positive patients.

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

Age (Yrs)	Male (n=78)(%)	Female (n=22)(%)
< 20	1 (01.28)	0 (00.00)
20 – 30	31 (39.74)	8 ( 36.36)
30 – 40	40 (51.28)	14 (63.63)
40 – 50	5 (06.41)	0 (00.00)
> 50	1 (01.28)	0 (00.00)

Table–1 Shows that there were 78% male and 22% female have HIV.

Table–1 Shows that among male patients, highest number of patients were from 30-40 years of age and then gradually decrease in number in 20-30 and 40-50 years of age group and in less than 20 and more than 50 years of age group the number of patients were one.

Among female patients, highest numbers of patients were from 30-40 years of age and then gradually decrease in number in 20-30. In 40-50 years of age group and in less than 20 and more than 50 years of age group the number of patients were zero.

**Table–2: Isolates in HIV positive patients**

Isolated fungi	Number (n=100) (%)
Candida species	55 (55.0)
Cryptococcus neoformans	04 (4.0)
Aspergillus species	03 (3.0)
Dermatophytes	04 (4.0)
No isolates	44 (44.0)

Table–2 shows that Among all patients detection of Candida species was 55%, Cryptococcus neoformans was 4%, Aspergillus species was 3%, Dermatophytes was 4% and in 44% cases no isolates seen.

## DISCUSSION

Prevalence of Candida species in HIV positive patients was 40% by Sushilkumar, 26.38% by Surat govt medical college, 24.24% by Aruna aggarwal, 88% by Nilanjan chakroborty, 41.7% by Anupriya wadhwa, 54% by Janice K Louie while 55% in the present study.

Prevalence of cryptococcal infection in HIV positive patients was 2.77% by Surat Government medical college, 1.51% by Aruna aggarwal, 10% by Anupriya wadhwa, 4% by Nilanjan chakroborty, 9% by Janice K Louie and 4% in the present study.

**Table -3: Prevalence of Candida infection in HIV positive patients**

Author and place of study	Year	Prevalence
Sushilkumar, PGIMER, Chandigarh <sup>7</sup>	2009	40%
Government medical college, Surat	2007	26.38%
Aruna aggarwal, amritsar <sup>8</sup>	2005	24.24%
Nilanjan chakroborty, ICMR, kolkata <sup>9</sup>	2007	88%
Anupriya wadhwa, IJMM, Delhi <sup>10</sup>	2007	41.7%
Janice K Louie, international journal of STD & AIDS <sup>11</sup>	2004	54%
Present study	2009	55%

Prevalence of Aspergillus species in HIV positive patients was 1% by VV Shailaja, 3.2% by Yaoundé Central Hospital (YCH), 8.3% by Anupriya wadhwa and 3% in the present study.

Prevalence of Dermatophyte species in HIV positive patients was 13% by Shobhana et al, 1.65% by SP Nair et al and 4% in present study.

The prevalence of different fungal infections varies with geographical areas and patient's immune status.

## CONCLUSION

Hundred HIV positive patients presenting to the Voluntary Counseling and Test Centre, P.D.U Medical College, Rajkot, Gujarat and patients admitted in various medical wards were included in the study. This study was undertaken to determine various opportunistic fungal infections among HIV positive cases attending P. D. U. Medical College & Hospital, Rajkot.

Among occupation of HIV positive male patients 70.51 % were labourers that suggests that in this region it is common in labourers.

The most common opportunistic fungi in the study population was *Candida* (55%) followed by *Cryptococcus neoformans* (4%), *Dermatophytes* (4%) and *Aspergillus* (3%).

This study suggests opportunistic fungal infection is highly prevalent among HIV positive person.

Our results are comparable with some of the studies conducted in India and abroad.

People with a healthy immune system usually have more than 950 T-helper cell in each cu.mm. of blood. The number of T-helper cell usually fall over the course of HIV infection. Serious fungal infection tend to occur, when T- helper cell count has dropped to around 100.<sup>12</sup>

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