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Opportunistic infections among HIV patients attending tertiary care hospital, Bikaner, Northern Western Rajasthan, India

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Abstract
In 20th century HIV (Human Immunodeficiency Virus) is the most emerging infection and this infection leading to Acquired Immunodeficiency Syndrome (AIDS) which cause immunosuppersion in patients living with HIV/AIDS (PLWHA) and making these people susceptible to various opportunistic infections that infections are responsible for morbidity and mortality. The pattern of Opportunistic infection in people living with HIV/AIDS attending ICTC Tertiary care hospital, Bikaner was studied. Detailed history taking, clinical examination and laboratory tests were carried out in 100 patients, Male-65 (65%) and Female 35 (35%). tuberculosis was most common frequent opportunistic infections in HIV patients accounting for 59% of all opportunistic infections, followed by candidiasis in 41% of all patients. Pneumocystosis was seen in 11%, Cryptococcal infection in 10% and parasitic diarrhoea in 17%. Finding points to be importance of early diagnosis and treatment of opportunistic infections in order to improve quality and expectations of life.

Keywords: opportunistic infections, tuberculosis, HIV

Introduction

In summer of 1981 AIDS was first recognized in the United States, when the US Centers for Disease Control and Prevention reported the unexplained occurrence of Pneumocystis jiroveci (formerly P. carinii) pneumonia in five previously healthy homosexual men in Los Angeles [1]. In India first case of HIV/AIDS was reported in Tamil Nadu in 1986

The infections that are more frequent or more severe because of immune-suppression in HIV infected persons are known as Opportunistic infections and these infections are most common clinical manifestation of HIV patients [2, 3].

Human Immunodeficiency Virus (HIV) is the most devastating plague facing us as the 21st century begins. Worldwide there are 33.3million people living with HIV. In India the prevalence of HIV infection is estimated to be 0.34% population of world and third-highest total HIV infection globally, which translates to 2.31 million people living with HIV/AIDS (PLHIV) and Karnataka is among high prevalent states in India [4].

In human immunodeficiency virus (hiv) infection, body immune system are progressively Impairmed which continuously increased susceptibility to tumours, and the fatal conditions Knows as acquired immunodeficiency syndrome (AIDS) [5].

Due to immune-deficiency in HIV patients, HIV patients develop a variety of opportunistic infections that have a significant impact on their well-being, health care costs, quality of life and their survival [6].

In HIV infection viral load continuously increases in patients with acute opportunistic diseases that may be indirectly affected by the occurrence of opportunistic diseases. After antiretroviral treatments begin life of HIV people infected improved, but neurological symptoms due to co morbidity conditions still remains public health important for HIV infected individuals [7, 8, 9].

In chronic HIV infection, immune system are progressively destructed so level of CD4 cells continuously fall (<200/µl to <50 / µl) is responsible for the occurrence of infections by a variety of opportunistic microorganisms [10].

Due to immune system destruction, HIV/AIDS patients are not be curable but most of the opportunistic infections can be treated effectively. Proper treatment plan and prophylaxis against some of opportunistic infections will not only prolong the life of an HIV infected individual but also improve the quality of life and their survival. National AIDS Control Organization (NACO) data reveal that tuberculosis is the commonest infection in AIDS patients, followed by candidiasis, cryptosporidiosis and others [11].

In AIDS patients there are many pathogens like Viral, Bacterial, Fungal and Protozoan are associated that changing symptomatology and pathology of disease, HIV make a base for successful invasion by opportunistic infections that are etiological killer of patients (Sandhu *et al*., 2013) [12]

In India the National AIDS Control Programme (NACP) was launched in 1992, and is being implemented as a comprehensive program for prevention and control of HIV /AIDS.

Considering this fact, the present study was conducted to determine the prevalence of bacterial, parasitic, fungal infections in HIV seropositive patients. The present study attempts to determine the various OIs prevalent in HIV seropositive patients tested at a tertiary care hospital in Bikaner, Rajasthan.

Material and Methods

The data for the study is secondary in nature collected from the Integrated Counseling and Testing Centre (ICTC) records of Sardar patel Medical College and P.B.M. Hospital in Bikaner, Rajasthan. 100 HIV positive people registered during 01 years (2017) was included in the study. Socio-demographic profile of the patients, and information on mode of transmission and opportunistic infections were collected from the records. Detailed history taking, clinical examinations, and laboratory test were carried out for diagnosis of Opportunistic infections. These Opportunistic infections co-related according to level of CD4 cell count. In view of the sensitivity and ethical perceptions of the study, anonymity and confidentiality were strictly followed. Data was entered and analyzed using SPSS 16.0. Descriptive analysis of frequencies and percentages were generated for the variables.

Inclusion criteria

All adult patients who diagnosed of HIV/AIDS referrals from other departments during January to December 2017were included in this study.

Exclusion criteria

Patients admitted to Pediatric wards, patients with all other immune compromised states such as malignancies, organ transplant, patients on steroids therapy or immunosuppressive therapy and diabetes mellitus were excluded.

Data collected was strictly confidential. Institutional ethical committee of Sardar patel Medical College and P.B.M. Hospital approved the study design.

Screening for opportunistic infections

As per the standard protocols different samples were collected from the patients depending on their presenting complaints. In these samples we were included stool, sputum, gastric aspirate, urine, blood, pus, and cerebrospinal fluid (CSF).

Samples requiring invasive procedure (blood, CSF, etc.) were collected only when indicated.

All the samples were processed in the Department of microbiology and immunology laboratory as per the standard techniques. Sputum and gastric aspirate samples received in the laboratory were screened using Gram stain, modified ZN staining (for acid-fast bacilli), 10% KOH wet mounts (for fungal pathogens), and modified toluidine blue-O and Giemsa staining from detecting cysts/trophozoites of P. jiroveci.[1] Stool samples were first concentrated using formol-ether sedimentation technique (modified Ritchief's method) and Sheather's sugar flotation technique and were screened for parasitic infections by microscopy. Modified Ziehl–Neelsen (ZN) stain was also made to screen for oocysts of Cryptosporidium parvum. Stool specimens were cultured for identifying any bacterial pathogen.[1]Urine samples received in the laboratory were processed using the standard method and identification of the bacterial colonies (if any) was done based on colony morphology and using the appropriate biochemical tests.[1,] Blood samples received in blood cultures were incubated at 37°C for 18–24 h and then serially subcultured after 24 h, 72 h, and 7 days. CSF was subjected to microscopic examination and cultured using the standard techniques [1]

Results

Table 1: Gender wise distribution of Study subjects

Male	**65**
Female	35
Total	100

Table 2: Age wise distribution of Study subjects

Age	PIHL
10-19	01%
20-29	28%
30-39	52%
40-49	16%
50-59	03%
>60	00

Table 3: Distribution of study subjects based on type of opportunistic infections

Opportunistic infections	No. of cases	% of cases
Tuberculosis	59	59%
Candidiasis	41	41%
Pneumocystosis	11	11%
Cryptococcosis	10	10%
Cryptosporidiosis	08	08%
Strongyloidiasis	05	05%
Isosporiasis	04	04%
Toxoplasmosis	03	03%
CMV retinitis	03	03%
Herpes	05	05%

Table 4: Marital status of Study subjects

Married	64
Unmarried	22
Widow	06
Divorced	08

Results and Discussion

Our study was conducted in North West Rajasthan, Bikaner. In India Rajasthan contribute 5% of total HIV load with more than 5 thousand new infection in the year 2015, as reported by NACO [13].

In the present study 100 cases of HIV patients which were studied, maximum number of patients who had opportunistic infections fell in the age group of 30-39 yrs (52%), followed by age group 20-29 yrs (28%),40-49 yrs(16%),50-59 yrs(3%) and 10-19 yrs(1%).No patients were found in the age group above 60 yrs.(Table 2) These findings were in accordance with study conducted by T.Gangadhara Goud *et al.* [14] where maximum number of HIV patients were in third and second decade of life. In the present study it was observed that gender distribution of male and female have different infections. A total of 100 cases of HIV patients, there was higher proportion of males n=65(65%) as compared to females n=35(35%). The ratio of male to female was 1.85:1.

In our study we observed that most of patients were second and third decade of age group and all the patients fell below six decade of life comparable to Garcia Ordonez MA *et al.* (1998) [15], T. Gangadhara Goud *et al.* [14]. So it should a conclusion after different and our study that the frequency of

opportunistic infections was highest in the sexually active age group of the society. Heterosexual transmission is mode of transmission of HIV patients in all study subjects group. In our study the trend of young and productive generation found are more in HIV patients that reflect that India will face, young age group work force is affected.

In our study we observd that 64 HIV patients were married and living with their spouse followed by 22 person were unmarried, 6 women were widow and 8 women were divorced.

In our study it was observed that tuberculosis was most common frequent opportunistic infections in HIV patients accounting for 59% of all opportunistic infections, followed by candidiasis in 41% of all patients. Pneumocystosis was seen in 11%, Cryptococcal infection in 10% and parasitic diarrhoea in 17%.

A study done by SK Sharma *et al.* (2004) [16] also observed that tuberculosis (TB) was frequent opportunistic infection (71%) followed by candidiasis (39.3%).

Similar study done by Patel AK *et al.* (1994) [17] also found that Oropharyngeal candidiasis (41.94%) was common opportunistic infection followed by Pulmonary and extra Pulmonary tuberculosis (25.81%), Recurrent Pyogenic infections (12.90%), Pneumocystis Carinii pneumonia (12.90%), AIDS Dementia Complex(9.68%), and Recurrent Herpes Zoster (9.68%).

Similar study done by Kumawat S *et al.* (2016) [18] in NW Rajasthan also observed that 32(10.66%) of patients had pulmonary tuberculosis, 7 (2.33%) patients had extra pulmonary tuberculosis.

A study done by M. Vajpayee *et al.* (2003) [19] observed in study that most common opportunistic infection was tuberculosis (47%) followed by parasitic diarrhea (43.5%), oral candidiasis (25.2%).

A study done by Giri TK *et al.* (1995) [20] found that oropharyngeal candidiasis was main opportunistic infection followed closely by tuberculosis (both pulmonary and extra pulmonary). Other opportunistic infections like Cryptococcosis, Cryptosporidiosis and Cytomegalovirus waere also found in HIV patients but after signifant fall in CD4 to below 100/cmm and Pneumocystis carinii pneumonia was found in terminal event mean CD4 count below 6/cmm.

Another study done by Singh *et al.* (2003) [21] that Oral candidiasis (59.00%) was predominant opportunistic infection observed in HIV patients followed by tuberculosis.

A study done by Kumarasamy *et al.* [22] in southern India also reported that pulmonary tuberculosis (49.3%) was most common opportunistic infections in respect to extrapulmonary tuberculosis (11%) and study done by Vandana *et al.* [23] in Delhi also found that Tuberculosis is the commonest opportunistic infection in HIV patients.

In our study oral oral candidiasis was reported in 41% cases of all opportunistic infections and candidiasis is second most common infections.

Similar study in sourth India also reported that oral candidiasis was found in 59% of AIDS cases [21]. It is also reported that candidiasis was most common opportunistic infection among HIV patients, it has been documented that it found in upto 70% of cases [22].

A study done by Saha *et al.* from Kolkata found that most common opportunistic infections was oral candidiasis (53.43%), followed by diarrhea (47.05%) and TB (35.29%) [24].

A study done by Patel *et al.* Ahmedabad also reprted that candidiasis was most common opportunistic infection (32.67%) followed by TB (22.71%) [25].

In HIV patients recurrent GIT (gastrointestinal infection) infections are very common. In HIV patients the occurrence of diarrhea 90% in developing country and 30-60% in developed countries. In our study parasitic diarrhoea was reported in 17% among all opportunistic infection. C. parvum (8%) was the most common pathogen among the opportunistic parasites. Several studies from India and other parts of the world have also reported the same [26-28].

In our study Tuberculosis is the commonest opportunistic infection in adults and pattern of Opportunistic infections in a particular area helps the attending physicians and take prompt therapeutic measures.

In opportunistic infections (OI) early detection of infection with HIV and later proper anti microbial plan of infection reduce morbidity and mortality. For early detection special health education of people living with HIV must need.

In worldwide India is the third largest country presently living population of HIV infection after south – Africa and Nigeria. Spread of HIV infection from one country to another country presently greatest challenges to public health.

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