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Recent scenario of Opportunistic infection in HIV-infected individuals at a tertiary care hospital in Bilaspur (C.G.)

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Abstract

Introduction: Opportunistic Infections are now more frequent and more severe because of immunosuppression in HIV infected person. Its spectrum varies from continent to continent. The aim of present study was to document the spectrum of opportunistic infections in HIV infected patients in a tertiary care hospital of Bilaspur (C.G.)

Method: A cross sectional study design was conducted among 689 clinically suspected HIV patients in one year duration in Chhattisgarh institute of medical sciences, a teaching hospital, Bilaspur (C.G.), to evaluate different opportunistic infections in individual in which HIV positivity was confirmed by three rapid tests as recommended by NACO guidelines.

Result: Out of 689 clinically suspected HIV patients, 161 were HIV seropositive (23.4%). Heterosexual contact was the major route of transmission (95%). Majority of them were in the age group of (20-39 years) i.e. 62%. Majority of HIV patients were male (77%). Tuberculosis was most common opportunistic infection (31.4%) followed by diarrhea caused by *Cryptosporidium parvum* (15.7%).

Conclusion: Tuberculosis is the commonest opportunistic infection seen in HIV patients. Early diagnosis of opportunistic infection and appropriate antimicrobial prophylaxis can reduce the morbidity and mortality in HIV patients.

Keywords: Opportunistic infections, HIV

Introduction

About 36.3 million people are infected with human acquired immunodeficiency virus (HIV) around the world. India has 2.1 million people living with HIV, the third largest population of people infected with the virus in the world after South Asia and Nigeria according to the UNAIDS Gap report 2014. The prevalence of HIV infection is estimated to be 0.34% of the population in India.[(1)]

India presents a wide variety of HIV related risk environment in terms of behaviour, political and cultural factors. Within the framework of this diversity and high prevalence of infectious diseases, trends of AIDS incidence in India are different from that seen in developed world.

Acquired Immuno Deficiency Syndrome (AIDS) represents the most severe consequences of immunosuppression caused by HIV. Oppotunistic Infections (OIs) are the major causes of morbidity and mortality in HIV infected patients. This could be due to the decreased level of immunity in such patients due to destruction of CD4+ cells.[(2,3)] The widespread use of effective chemoprophylaxis for opportunistic infections and more recently the use of antiretroviral therapy (ART) have resulted in delay in the onset of AIDS, longer survival and a change in the pattern of opportunistic infections in various parts of the world.[(4,5)] State wise statistics on OIs in HIV-infected individuals varies in India.[(6)] The spectrum of OIs in HIV positive cases is unclear in the state like Chhattisgarh. Hence, present study aimed to record recent trends of different OIs in individuals who tested HIV positive, at a tertiary care hospital in Bilaspur (C.G.), India. An update on different OIs may further add to the effective implementation of the present programs on IV managements.

Materials and Methods

The study was carried out in the department of Microbiology at Chhattisgarh institute of medical sciences, a 500-bedded teaching hospital, Bilaspur (C.G.), from July 2013 to June 2014.

Study population: 689 clinically suspected cases of HIV (according to World Health Organization) from in-patients and out-patients department of hospitals were included in the study. Institutional Ethical clearance and written consent was obtained from all the patients to be included in the study. HIV positivity were confirmed by three rapid tests with different antigen/principles (Testing strategies III) as recommended by National AIDS Control Organization (NACO) guidelines, Ministry of Health and Family Welfare, Government of India.[(7)] Antibodies against HIV (1 and 2) were tested first time by COMBAIDS-RS Advantage[ST] (ARKRAY Healthcare Pvt. Ltd., Surat, India). Samples found positive were tested by MERISCREEN HIV 1-2 WB (Meril Diagnostic Pvt. Ltd., Gujrat, India) and HIV ½ Trispot test kit, AIDSCAN (Bhat Bio-Tech India Pvt. Ltd, Bangalore, India). Necessary pre and post test counseling of the patients was carried out and detailed history including personal details, possible route of transmission etc. was taken. Various specimens e.g. sputum, oral swabs, oesophageal brush, bronchoalveolar lavage, stool, blood, lymph node

aspirate and cerebrospinal fluid (CSF) from patients were collected taking all universal aseptic precautions.

Early morning expectorated sputum samples were collected in sterile, wide mouth, screw cap containers. For the detection of bacterial pathogens, samples were processed for Gram stain, Ziehl and Neelsen (ZN) stain and aerobic culture on selective and enrichment media (Lowenstein Jensen media, blood agar) as per the standard protocol. The bacterial isolates were identified using standard microbiological guidelines.[8]

Stool sample was collected in clean container. It was processed for the investigation of parasitic pathogens. Parasite detection was done by direct wet mount preparation (saline and iodine) and wet preparation from formal ether concentrated method for the detection of protozoal trophozoites, cysts, helminthic eggs and larva. For the detection of coccidian parasites, smears of stool samples were prepared and stained with modified acid fast method by using 1% sulfuric acid.[9]

Two oral swabs were taken from each patient. One swab was used for wet mount (10% KOH, i.e. potassium hydroxide) and Gram stain to diagnose any fungal etiology. The other swab was inoculated on Sabouraud's Dextrose Agar (SDA) with antibiotics. The growth obtained on SDA was identified as yeasts as per the standard protocol including Gram stain, germ tube test, chlamydospore formation on corn meal agar, sugar assimilation, sugar fermentation and urease test.[10,11]

Cerebrospinal Fluid (CSF) samples from suspected patients of meningitis were collected. Wet mount, India ink preparation, gram stain and culture on SDA and chocolate agar were carried out in CSF samples. Plates of chocolate agar were incubated at 37°C in candle jar. The growth obtained on chocolate agar and SDA was identified as per the standard protocol.[10,11]

Blood samples were collected as per standard procedure and processed in BacT/ALERT® 3D.

Broncho alveolar lavage was taken and smear was stained with giemsa stain to see the cyst and trophozoites of *Pneumocystis carinii*.[12]

Result

Out of 689 clinically suspected HIV patients, 161 were HIV seropositive (23.4%). Majority of HIV patient were male. Heterosexual by promiscuous behavior was observed to be the single most important factor 95%. The age & sex distribution of cases is shown in the Table 1.

Table 1: Showing age and sex distribution in HIV patients (n=161)

Age Group (in Years)	Male	Female	Total
20-39	76 (76%)	24 (24%)	100 (62%)
40-59	37 (77%)	11 (23%)	48 (30%)
> 60	12 (91%)	1 (9%)	13 (8%)
Total	125 (77%)	36 (23%)	161 (100%)

Majority of them were in the age group of (20-39 Years) i.e. 62% followed by 30% in the age group of (40- 59 Years). It was found that 77% were male & 23% were females, while male/ female ratio was (3.4: 1).

Most of the populations were young, adult & outside from Chhattisgarh came for search of job.

Out of 161, 155 (96.2%) patients were presented with more than one symptom. Various symptoms presented by these patients are shown in table – 2. Most common symptom was fever (67%) followed by weight loss (58.3%) and chronic diarrhea (54.03%). Dysphagia due to oral thrush and oesophagitis were seen in 20.49%, general lymphadenopathy in 17% while headache with altered sensorium in 10.5% patients seen at the time of presentation.

Table 2: Showing frequency of various symptoms presented by HIV patients (n=161)

Clinical features	No. of patients	%
Fever	108	67.08
Weight loss	94	58.38
Chronic diarrhea	87	54.03
Cough and dyspnoea	78	48.44
Dysphagia	33	20.49
Gen. lymphadenopathy	24	16.77
Headache and altered sensorium	17	10.5

We exclude 41 seropositive patients due to death or leave against medical advice (LAMA) or inadequate specimen quality so could not follow up. In remaining 120 patients, 153 pathogens were isolated comprising of bacterial, fungal & parasitic infection.

Among 120 patients in 87 patients single pathogen were isolated while in 33 patients more than one pathogen was isolated. Among all patients, 48 (31.4%) patients had tuberculosis followed by diarrhea caused by *Cryptosporidium parvum* in 24 (15.7%) patients. Details of all OIs shown in Table 3.

Table 3: Showing distribution of different pathogen isolated from various clinical samples (n=153)

Samples / ***Pathogen***	**Sputum**	**Lymph node**	**CSF**	**Stool**	**Oesophageal aspirate**	**Blood**	**BAL**	**Urine**	**Total**	**%**
Mycobacterium tuberculosis	**33**	**9**	**6**						**48**	31.4%
Cryptosporidium parvum				**24**					**24**	15.7%
Cryptococcus neoformans			**13**						**13**	8.3%
Candida species					**12**				**12**	7.9%
Shigella species				**12**					**12**	7.9%
Salmonella typhi				**1**		**9**			**10**	6.5%
Isospora belli				**8**					**8**	5.2%
Coagulase negative Staphylococcus						**6**			**6**	4%
Pneumocystis carinii							**6**		**6**	4%
Pseudomonas species	**2**							**2**	**4**	2.6%
Strongyloides sterocoralis				**4**					**4**	2.6%
Cyclospora				**3**					**3**	2%
Entrobacter species						**2**			**2**	1.3%
Citrobacter species								**1**	**1**	0.6%
Total	**35**	**9**	**19**	**52**	**12**	**17**	**6**	**3**	**153**	**100%**

Discussion

In the present study, out of 161 patients, majority were in the reproductive age group, i.e. 20–29 years (62%, 100/162), with a male preponderance (77%, 121/161). Rangnathan and his colleagues reported 77.4% male patients with 81% patients in the age group of 21-40 years in their study done at South India.[13] According to Bhagyawatidevi *et al*. the highest number of HIV patients were in the age group of 21–30 years (63%) with majority of male patients (94%) in their study done at Manipur.[14] Majority of them were migrants staying away from home, thereby increasing the risk of HIV infection. Heterosexual contact (95%) was the commonest route of transmission in our study which correlates well with other studies.[13,15] More than 80% rate of heterosexual transmission was also reported by NACO (87.1%) and Rangnathan *et al* (95%).[13] In the present study, majority of patients (96.2%) had more than one symptom. Fever and weight loss were the predominant symptoms, followed by cough, oral lesions and diarrhea. The clinical spectrum reported in the present study was similar to that reported in Lucknow by Ayyagari *et al*.[15] and by Aruna Aggarwal *et al* in Amritsar.[16] Polymicrobial etiology in 33 of the HIV reactive patients is a significant finding, indicating severity of the infection in this group. Tuberculosis is the commonest OI followed by diarrhea due to *C.parvum* and meningitis by *C. neoformans*. Similar results were also found by various studies.[14,15]

Conclusion

The present study reflects that tuberculosis presents as the commonest OI followed by diarrhea due to coccidian parasites among the HIV/AIDS patients of Chhattisgarh. Moreover, this is the first study to assess cumulative data on OIs among HIV/ AIDS patients from Chhattisgarh region showing the real-time distribution from Central India and thus would serve as a mile stone for future evaluation. This study would also help the clinician to increase the awareness about the disease and also help them to come up with right diagnosis and earlier treatment of these infections with the proper management of patients especially in resources limited region like Chhattisgarh in India.

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