Changing Trends of HIV/AIDS in Otorhinolaryngology with CD₄⁺ Count Correlation

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Abstract Human immunodeficiency virus (HIV) affects the vital cells of the immune system eventually leading to a fall in the cell mediated immunity. As the disease progresses CD₄⁺ (cluster of differentiation4) cells reduce, therefore is a good indicator of the ongoing disease process [1]. HIV infection has myriads of disease presentation; the aim of our study was to correlate the otorhinolaryngological manifestations with the CD₄⁺ counts. A clinical study, of 100 HIV positive patients was done from 2008 to 2011. A clinical evaluation revealed 76 % incidence of otorhinolaryngological findings. Oropharyngeal manifestations were the commonest, seen in 48 %, predominantly oropharyngeal candidiasis. Neck nodes were found in 20 % of the patients. 31 % had otological manifestations of which retracted tympanic membrane (eustachian tube dysfunction) was the commonest. 18 % had nasal symptoms of which rhinosinusitis was the commonest being 14 %. The mean CD₄⁺ count was below 200 in patients who presented with oropharyngeal candidiasis, otitis externa and epistaxis. With the use and availability of HAART (Highly active antiretroviral therapy) more and more patients with higher CD₄⁺ count are presenting with a different spectrum of more subtle disease manifestations, with lower incidence of the classical diseases like candidiasis. A routine

otorhinolaryngological evaluation at every visit with high index of suspicion can help in better disease control and give a better quality of life.

Keywords HIV · AIDS · Otorhinolaryngological manifestations · CD₄⁺ count

Introduction

Acquired immune deficiency syndrome (AIDS) is the end stage of the disease process caused by human immune deficiency virus (HIV). Since the first reported cases in 1981 (USA), 1986 (INDIA) [2] this retrovirus has taken the form of a pandemic. HIV has been given this name because of its long-term effect, to attack the immune system of the body, making it weak and deficient.

HIV infects vital cells in the human immune system such as helper T cells (specifically CD₄⁺ T cells), macrophages, and dendritic cells [3]. HIV infection leads to low levels of CD₄⁺ T cells through a number of mechanisms including: apoptosis of uninfected bystander cells [4], direct viral killing of infected cells, and killing of infected CD₄⁺ T cells by CD₈⁺ cytotoxic lymphocytes that recognize infected cells [5]. When CD₄⁺ T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes progressively more susceptible to opportunistic infections. As the CD₄⁺ count drops below 200 cells/mm³, patients become vulnerable to many of the processes associated with AIDS.

The disease mirrors the immune system, with decrease in CD₄ count the spectrum also changes. This study was conducted to evaluate the spectrum of otorhinolaryngological manifestations in HIV positive patients with their CD₄ count at the time of presentation. The study aimed at

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identifying certain trends that could alert the clinician to start prompt treatment, to prevent further progression.

Materials and Methods

This clinical study was conducted from July 2008 to November 2011, wherein 100 patients attending ART clinic, were randomly selected. After consent and maintaining complete secrecy of the identity of the patient, a full otorhinolaryngological examination was done. All patients who were confirmed to be HIV positive on treatment (HAART) or without treatment were included in the study. A through ENT examination was done. Data was collected, tabulated and analysed.

Observations

A total of 100 patients were examined. The commonest age group of presentation was 30–39 years (Table 1). The male to female ratio was 3:1, with the predominant mode of transmission being heterosexual contact (83 %). Other modes of transmission being intravenous drug abuse (10 %), blood transfusion (4 %) and mother to child transmission (3 %) (Table 2).

Clinical examination revealed otorhinolaryngological manifestations in (76 %) of patients. Oropharyngeal manifestations were the commonest at (48 %) in the 100 patients examined. Oral candidiasis was seen in (20 %) of the 100 patients with a mean CD_4^+ count of 187 (Table 3). Neck nodes were found in (20 %) with a mean CD_4^+ count of 239. Otological findings were positive in (31 %) of the patients. The commonest ear manifestation was a retracted tympanic membrane (13 %) with a mean CD_4^+ count of 376 (Table 4). Nasal pathology was found in (18 %) with commonest being rhinosinusitis, with mean CD_4^+ count of 293 (Table 5).

Table 1 Age distribution

Age	Percentage
0–9	1
10–19	2
20–29	17
30–39	44
40–49	26
50–59	9
70–79	1
Total	100

Table 2 Mode of transmission

Mode of transmission	Percentage
Heterosexual	83
Blood transfusion	4
Intravenous drug abuse	10
Mother to child	3
Total	100

Table 3 Mean CD_4 count in oropharyngeal pathologies

Oropharyngeal findings	No. of cases	Mean CD_4 count
Leukoplakia/erythroplakia	7	263
Aphthous ulceration	17	218
Oral candidiasis	20	187
Laryngitis/pharyngitis	17	235
Oesophageal candidiasis	5	238

Table 4 Mean CD_4 count in aural pathologies

Ear findings	No. of cases	Mean CD_4 count
Acute suppurative otitis media	2	418
Chronic suppurative otitis media	12	193
Non suppurative otitis media	13	376
Otomycosis	7	210
Serous otitis media	1	224
Otitis externa	2	178

Table 5 Mean CD_4 count in nasal pathology

Nasal findings	No. of cases	Mean CD_4
Rhinosinusitis	14	293
Vestibulitis	3	229
Epistaxis	1	139

In patients with candidiasis, epistaxis and otitis externa the CD_4^+ counts were below 200 which is considered to define AIDS as per CDC classification.

On systemic examination and investigation 32 % had tuberculosis (pulmonary/extrapulmonary or both), 4 % were HB_sAg (Hepatitis B surface antigen) positive and 1 % was VDRL (Venereal Disease Research Laboratory) test positive.

Discussion

HIV infection has four basic stages: incubation period, acute infection, latency stage and AIDS. The first stage of infection, the primary, or acute infection, is a period of

rapid viral replication that immediately follows the individual's exposure to HIV leading to an abundance of virus in the peripheral blood with levels of HIV commonly approaching several million viruses per mL.

This response is accompanied by a marked drop in the numbers of circulating CD_4^+ T cells. The activation of CD_8^+ T cells, which kill HIV-infected cells. There is subsequently antibody production and seroconversion. During this period (usually 2–4 weeks post-exposure) most individuals (80–90 %) develop an influenza or mononucleosis-like illness [6, 7] called acute HIV infection, the most common symptoms of which may include fever, lymphadenopathy, pharyngitis, rash, myalgia, malaise, mouth and esophageal sores[7].

A strong immune defense reduces the number of viral particles in the blood stream, marking the start of the infection's clinical latency stage. During this early phase of infection, HIV is active within lymphoid organs, where large amounts of virus become trapped in the follicular dendritic cells network.

When CD_4^+ T cell numbers decline below a critical level of 200 cells per μ L, cell-mediated immunity is lost, and infections with a variety of opportunistic microbes appear. The first symptoms often include moderate and unexplained weight loss, recurring respiratory tract infections (such as sinusitis, bronchitis, otitis media, pharyngitis), skin rashes, and oral ulcerations.

CDC has classified [8] HIV on the basis of the lowest recorded CD_4^+ count and the presence of symptoms into A, B, C categories is used for treatment purposes. Where CD_4^+ counts are not possible WHO classification based on clinical features is used to classify patients in 1–4 clinical stages [9].

All these classification systems are to make the treatment protocols simpler depending on the level of strength of the immune system. The timing of when to initiate therapy has continued to be a core controversy within the medical community. The WHO recommendations (2013) [10] are to start HAART (Highly active antiretroviral therapy) in WHO clinical stage 3 and 4 patients, or if the CD_4^+ count is below ≤ 500 , co infection with HBV (Hepatitis B Virus), active tuberculosis and serodiscordant couples, all pregnant women, all children below 5 years of age.

In our study of the 100 patients 75 were on HAART, with majority of patients being on treatment the incidence of infection was lesser. The spectrum of diseases was also narrowed.

In our study the peak incidence of HIV was in 30–39 age group with a male to female ration of 3:1 which was comparable to other studies of Deb et al. [11] and Prasad et al. [12] (Table 1).

The mode of transmission was found to be heterosexual (83 %) (Table 2). Where as Deb et al. in their study “Head

and neck manifestations of HIV infection: a preliminary study” done in Manipur reported Intravenous Drug abuse as the commonest mode of transmission (65 %). H Kishore Chandra Prasad et al in their study “HIV manifestations in otolaryngology” done in Mangalore, Karnataka reported heterosexual mode as the commonest (65 %). Probably due to different cultural scenario and incidence of Intravenous drug abuse the mode of transmission was found to be variable.

The incidence of otorhinolaryngological manifestations in HIV positive patients was (76 %) comparable to Kishore Chandra Prasad et al. (79 %) [12]. A higher incidence was reported in studies done in paediatric population Hadfield et al. (91 %) [13] and Michael A Williams et al. (80 %) [14].

Oropharyngeal candidiasis was the commonest presentation (20 %) which was lesser than the incidence of 40 % reported by Kishore Chandra Prasad [12]. The mean CD_4^+ count were 187 (Table 3), reaffirming that CD_4^+ counts below 200 opportunistic infections become common.

The commonest otological presentation which brought the patient was chronic suppurative otitis media (12 %). On examination of all the patients a higher incidence of retraction of tympanic membrane was found (13 %) than otitis media, probably attributable to eustachian tube dysfunction. The mean CD_4^+ count in case of chronic otitis media was 193 were as retracted tympanic membrane was found at a higher CD_4^+ count of 376 (Table 4). These changes should alert the physician to treat an upper respiratory tract infection promptly to prevent development of acute otitis media in patients with pre existing eustachian tube dysfunction.

Sensorineural loss is associated with development of full blown AIDS mostly in patients with otosyphilis. In our study one patient was found to be VDRL positive, with no evidence of sensorineural hearing loss with tuning fork test.

Nasal pathology was found in (18 %) of the patients. Rhinosinusitis in (14 %) was comparable to (17 %) as reported by Kishore Chandra Prasad. The mean CD_4^+ counts were 293 in patients with rhinosinusitis. Epistaxis was found at a mean CD_4^+ count of 139 (Table 5).

Neck nodes were seen in (20 %) of the patients of which (13 %) were tubercular remaining being non specific. Variable results have been published from different parts of the world Michael A William reported (60 %) patients had neck nodes. Kishore Chandra Prasad reported (42 %). Alabi [15] had (9 %) incidence.

Hadderringh [16] “otorhinolaryngological findings in AIDS patients: a study of 63 cases” done in 1982 reported equal incidence of Kaposi sarcoma in male and female. No cases of Kaposi sarcoma and non hodgkins lymphoma associated with HIV were found in the head and neck region in our study.

75 out of the 100 patients study were receiving HAART at the time of examination. The availability of low cost drugs and increased awareness the timely administration of HAART had decreased the incidence of candidiasis. HAART suppresses the HIV multiplication and progress of infection such that CD_4^+ counts are maintained, opportunistic infections only set in when the count falls below 200.

Conclusion

The HIV positive patients should be regularly followed with the otorhinolaryngologist. As early changes in the ear, nose, pharynx and neck can be detected. The nose and throat are the portals of entry of many organisms into the body. Eminent fall in CD_4 count can be anticipated in view of the clinical presentation, and timely HAART can be started, before further worsening takes place.

The otorhinolaryngologist should be well aware of the wide range of presentation coupled with a high index of suspicion can enhance testing and diagnosis. HAART has improved the life expectancy of HIV patients and reduced the incidence of life threatening complications.

Conflict of Interest None.

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