

## Biostatistical analysis of the HIV-aids patients with reference to various factors

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**Abstract-** The prevalence of HIV /AIDS in Indian population has been carried out. However analysis of secondary infection after HIV is carried out by the present studies. A total of 58 patients suffering from HIV-AIDS were analyzed with reference to the age, gender, BMI and Mode of infection. Data analysis showed that patients suffering from HIV / AIDS have greater risks of Tuberculosis disorders. A distinct correlation between Tuberculosis and HIV/ AIDS was observed during the present studies.

**Keywords-** HIV, Tuberculosis

### Introduction

Human immunodeficiency virus (HIV) is a lentivirus member of the retrovirus family) that causes acquired immunodeficiency syndrome (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections. Infection with HIV occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate, or breast milk. Within these bodily fluids, HIV is present as both free virus particles and virus within infected immune cells. The four major routes of transmission are unsafe sex, contaminated needles, breast milk, and transmission from an infected mother to her baby at birth (Vertical transmission) Screening of blood products for HIV has largely eliminated transmission through blood transfusions or infected blood products in the developed world. HIV primarily infects vital cells in the human immune system such as helper T cells (specifically CD4+ T cells), macrophages, and dendritic cells. HIV infection leads to low levels of CD4+ T cells through three main mechanisms: firstly, direct viral killing of infected cells; secondly, increased rates of apoptosis in infected cells; and thirdly, killing of infected CD4+ T cells by CD8 cytotoxic lymphocytes that recognize infected cells. 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.

### Epidemiology

UNAIDS and the WHO estimates that AIDS has killed more than 25 million people since it was first recognized in 1981, making it one of the most destructive pandemics in recorded history. Despite recent improved access to antiretroviral

treatment and care in many regions of the world, the AIDS pandemic claimed an estimated 2.8 million (between 2.4 and 3.3 million) lives in 2005 of which more than half a million (570,000) were children. In 2007, between 30.6 and 36.1 million people were believed to live with HIV, and it killed an estimated 2.1 million people that year, including 330,000 children; there were 2.5 million new infections.

### Current scenario in India

India's first known HIV infection was diagnosed in a female sex worker in Chennai in February 1986. It is highly probable that HIV had been circulating for some years before that, since screening during 1986-87 found as many as 3%-4% of sex workers infected in Vellore and Madurai, and 1% of STD patients infected in Mumbai. As there were already over 20,000 cases in the world before any case was identified in India, screening for HIV infections began in India in 1985, almost as soon as tests for the HIV antibody were available. Across the world, country estimates have been revised with better data through community based and population surveys. In India, too, for the first time in 2006, HIV testing was a part of the National Family Health Survey (NFHS). The results of NFHS-III give us more accurate information about the estimates of those infected with HIV in the country.

### Materials and method

#### Selection of patients and collection of data

Data and blood collection was done from various hospitals and pathology laboratories of Gujarat . Samples form a total of 58 patients, including 16

women, aged between 15-50 years (median = 33), These included patients suffering from HIV AIDS was collected. Patients identified as suffering from HIV were classified according to the results of the ELISA and western blot detection with the doctors' guidance. A data of their age, gender, BMI, family history, hemoglobin and history, mode of infection was generated.

**ELISA Test**

Patient's blood samples was collected and centrifuge the sample at 2000 rpm for 5 min. collect the supernatant comprising mainly of serum. Patients not in window period are those that contains HIV antibody in serum sample which was detected by ELISASPOT test kit from genei (Banglore).

**Microscopic Examination**

Differential staining was performed of the samples from all 58 patients. For this the morning sputum of patients was collected and were examined by acid fast staining for the detection of mycobacterium tuberculosis infection.

**Procedure for acid-fast staining**

Prepare smear from sputum specimen on glass slide, hit fix the smear. Flood the smear with carbol – fuchin stain. Heat gently and avoid boiling when steam arises. wash the slide with water. Cover slide with 20% sulfuric acid for 1 min, then counter stain with methylene blue for 1 min. Examine microscopically under oil immersion lenses. For further conformation fluorescent stain and florescent microscope was used.

**Analysis of data:**

Biostatistical analysis was done of the data. Bar chart analysis was carried out of the collected data.

**Results**

Data analysis of samples with respect to different factors affecting HIV was done as shown in table 1.

The collected samples of HIV affected patients showed a male is to female ratio of 3:1, where 70% of the patients were aged between of 15-40. This age showed maximum prevalence of HIV. The study of the BMI ratio showed that 65% of the patients were thin or normal with no patients showing high BMI ratio (corresponding to thin body built).

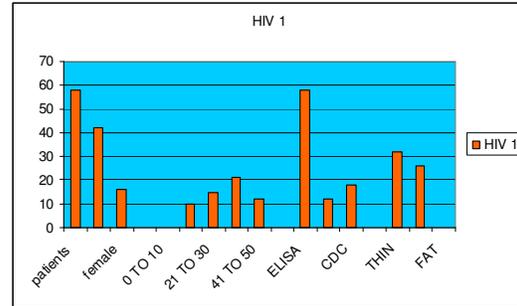


Fig. 1- Bar chart analysis for HIV patients

The sexual history was shown maximally in cases of HIV patients with about 60% showing positive sexual history whereas only 10% having blood transfusion. Others having no idea about mode of infection.

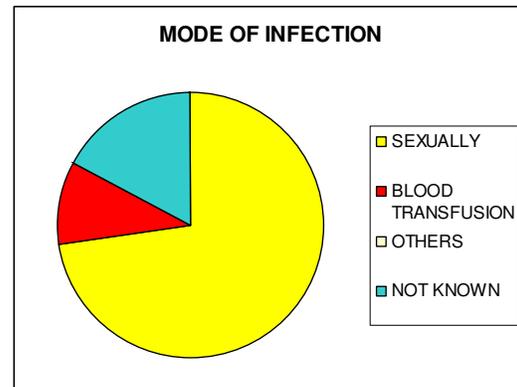


Fig 2- Mode of infection of HIV patients

**Secondary infection in HIV/ AIDS**

When focusing on the mycobacterium tuberculosis, 70% of the HIV patients were tuberculosis positive. Figure 4 shows the acid fast red color stained bacteria of Mycobacterium Tuberculosis. Another clinical factor known to be associated with HIV-AIDS is fungal infection. When analyzing the fungal infection of the HIV affected patients 30% were found to be infected.

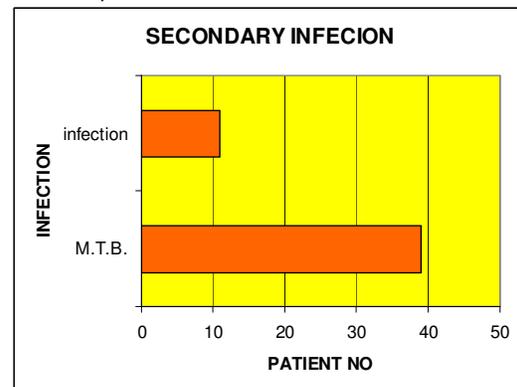


Fig. 3- Secondary infection in HIV / AIDS patient



Fig. 4- Acid fast staining

### Conclusion

The current study reports that HIV/AIDS is 2-3 times more common in males than in females. It emphasizes that the frequency of HIV / AIDS is found with age and peaks in persons aged between 15- 50 years. Cases of HIV / AIDS are mostly observed in thin people. The study confirms the theory emphasizing that there may be a chance of secondary infection in HIV patients. Common secondary infection in HIV infected patients is infection of mycobacterium tuberculosis which was prevalent in 70% of population of AIDS patients. The study shows that second chance of infection in AIDS is fungal infection. Most importantly Gujarat's population is affected with HIV 1 virus and mode of infection is mainly sexually and secondarily by blood transfusion. More than 20% are unaware with their mode of infections. In short the present studies confirm that HIV / AIDS has maximum chances of mycobacterium tuberculosis infection in the population of Gujarat.

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Table 1- Data analysis of samples with respect to different factors affecting HIV/AIDS

	HIV 1
TOTAL PATIENTS	58
MALE	42
FEMALE	16
AGE	
0 TO 10	0
11 TO 20	10
21 TO 30	15
31 TO 40	21
41 TO 50	12
51 TO 60	0
TUBECULOSIS	39
FUNGAL INFECTION	11
DIAGNOISED	
ELISA	58
WB	12
CD4CD8	18
BMI	
THIN	32
NORMAL	26
FAT	0
MODE OF TRNSFUSION	
SEXUALLY	42
BLOOD TRANSFUSION	6
OTHERS	0
NOT KNOWN	10