Original Research Article

Seroprevalence of HIV 1, HIV 2 and Both HIV 1 & 2 among Patients Attending ICTC in Tertiary Care Hospital, Vijayawada

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A B S T R A C T

K e y w o r d s	The Human Immunodeficiency Virus (HIV) infects cells of the immune system, destroying or impairing their function. Infection with the virus results in progressive deterioration of the immune system, leading to "Immune deficiency". This is a retrospective study done for 3 years from 2011 to 2013 in Integrated Counseling and Testing Centre (ICTC). Blood samples were collected from all patients and tested by HIV combaids test, HIV triline test, HIV tridot test as per NACO strategies. Total number of samples tested in ICTC for 3 years was 29,486. Among which 4683 (15.88%) samples were positive. The total number of HIV-1 was 4453 (15.1%), HIV-2 was 147 (0.49%) and both HIV-1 and 2 was 83 (0.28%). No indeterminate samples were noted. We concluded that HIV-1 is more prevalent than HIV-2. Both HIV-1 and HIV-2 prevalence indicates that chances of progressing to AIDS is more. Need to educate and create awareness among people to stop the spread of HIV infection in the community.
Human Immuno-deficiency Virus, Integrated Counseling and Testing Centre, HIV-1, HIV-2	

Introduction

The Human Immunodeficiency Virus (HIV) infects cells of the immune system, destroying or impairing their function. Infection with the virus results in progressive deterioration of the immune system, leading to "Immune deficiency". The Immune system is considered deficient when it can no longer fulfill its role of fighting infection and disease. Infections associated with severe immunodeficiency are known as "Opportunistic Infections", because they take advantage of weakened immune system. According to estimates by WHO and UNAIDS, 36.9 million people were living with HIV globally at the end of 2014. That same year, some 2 million people became newly infected, and 1.2 million died of AIDS-related causes.

Sub-Saharan Africa is the region that is most affected with devastating effect on life and socioeconomic activities. This region harbors 68% of people living with HIV and recorded 76% of HIV related deaths in 2007 (Ogunkolo *et al.,* 2006; Frederickson and Kanabus, 2005; UNAIDS/WHO 2007; www.tribune.com.ng). Since the beginning of the pandemic, three main routes of

transmission for HIV have been identified. They are: 1.Sexual route, 2.Blood or Blood products, 3. Mother to child transmission (MTCT).

There were approximately 36.9 (34.3–41.4) million people living with HIV at the end of 2014 with 2.0 (1.9–2.2) million people becoming newly infected with HIV in 2014 globally. Sub-Saharan Africa with 25.8 (24.0–28.7) million people living with HIV in 2014. Also Sub-Saharan Africa accounts for almost 70% of the global total of new HIV infections (WWW.Who.net).

HIV-1 and HIV-2 show very distinct epidemiology; while HIV-1 has spread globally. HIV-2 has mostly confined to West Africa and countries with socioeconomic links to Portugal. Since the first case of HIV-2 from India was reported in 1991, others have been identified from geographically diverse states, yet reliable and up-to-date information on the HIV-2 epidemic in India is still lacking (Kannangai *et al.,* 2003; Kannangai *et al.,* 2010). Sequential serological surveys from a hospital population in Tamilnadu performed during 1993-1997 and 2000-2001 showed a stable HIV-2 prevalence over time, at 2.47 percent of all HIV diagnoses at the latter time point, equating to 0.06 percent of all hospital attendees (Kannangai *et al.,* 2003).

Antiretroviral drugs are used in the treatment and prevention of HIV infection. They fight HIV by stopping or interfering with the reproduction of the virus in the body, reducing the amount of virus in the body.

As studies on HIV-1 and HIV-2 are less, by knowing the prevalence of HIV antibodies against HIV 1, HIV 2 and both HIV-1 and HIV-2 can estimate geographical distribution and risk factors. So that which will be helpful for controlling HIV by undertaking respective preventing measures. Survey of these also very much helpful in focusing on highly endemic communities and give them health education.

The Present study has undertaken to know the prevalence of HIV-1, HIV-2 and both HIV 1 & 2. This study has done which may be helpful in epidemiological survey and to know the spread of HIV 2 in this region.

Materials and Methods

This is a retrospective study done for 3 years from 2011 to 2013 in Integrated Counseling and Testing Centre (ICTC) at Siddhartha Medical College, Vijayawada.

Ethical Committee Permission has taken. The collection of data and its details has kept unlinked anonymously.

ICTC are following the guidelines of National AIDS Control Programme (NACO).

All the patients attending to ICTC were exposed to Pre-test counseling prior to the procedure. Patients came from urban areas, rural areas and district hospitals. Blood samples have taken by maintaining all aseptic precautions and by taking measures of Personal protective equipment (PPE). Needle destroying and sample discarding were followed according to Biomedical Waste Management rules.

Blood samples have tested for Anti HIV antibodies using three kits:

1.HIV Combaids test
2.HIV Triline test
3.HIV Tridot test

Interpretation of test results has done as per NACO strategies. Indeterminate samples were sent to Apex centers for confirmation of HIV.

All the patients who underwent the test were taken Post test counseling with counselors. The data regarding Total number of samples, HIV 1, HIV 2 and both positives were recorded. All HIV positive patients were advised to undergo CD4 analysis and to take Antiretroviral Therapy and also instructed them to come for follow-up.

Results and Discussion

Total number of samples tested in ICTC for 3 years was 29,486. Among which 4683 (15.88%) samples were positive.

The total number of HIV-1 was 4453 (15.1%), HIV-2 was 147 (0.49%) and both HIV-1 and 2 was 83 (0.28%). No indeterminate samples were noted (Fig. 1).

Year-wise distribution of positive samples of HIV has tabulated in table 1. HIV positive in 2011, 2012 and 2013 was 17.1%, 13.3% and 16.7% respectively.

Seropositivity of HIV 1, HIV 2, HIV 1 & 2 distribution year-wise was depicted in table 2. Among 4683 HIV positive samples, HIV 1 was 95%, HIV 2 was 3.1% and HIV 1 & 2 was 1.7%.

Distribution of HIV 1, HIV 2 and HIV 1 & 2 among males and females and more number of cases are seen in males than in females.

HIV 1 and HIV 2 originate from different primate species. HIV 1 entered the human population from chimpanzees of the subspecies *Pan troglodytes* living in equatorial West Africa and HIV 2 established as SIV from the sooty mangabey monkey *cercocebus atys*. Based on molecular and antigenic differences, these two types of HIV have been recognized.

HIV-2 has only 40 percent genetic identity with HIV-1. It is more closely related to

Simian Immunodeficiency Virus than to HIV 1. It is much less virulent than HIV-1. It is commonly held view that those infected with HIV-2 progress to AIDS uniformly at a slower rate than their HIV-1 counterparts. The treatment strategies among HIV 1 and HIV 2 differ. For HIV-2 NNRTIs are not active, a number of other drugs are less effective and pregnancy should be managed differently.

In the present study, the total number of HIV-1 was 4453 (15.1%), HIV-2 was 147 (0.49%) and both HIV-1 and 2 was 83 (0.28%). No indeterminate samples were noted.

Banadakoppa *et al.* (2008) observed that large variations in HIV prevalence were observed across the IBBA districts, ranging from less than 10% in five districts (Chennai 2%, Madurai 4%, Coimbatore 6%, Chittoor 8% and Shimoga 9%) to more than 30% in four districts (Pune 38%, Yevatmal 37%, Belgaum 34% and Kolhapur 33%). Most of the districts with a relatively low HIV prevalence (<10%) were in Tamil Nadu state, and most of the districts with a relatively high HIV prevalence were in Maharastra.

Kanki *et al.* (1994) reported that among 1452 female prostitutes the annual incidence of HIV-1 increased substantially: there was a 1.4 fold increased risk per year. The incidence of HIV-2 remained stable, despite higher HIV-2 prevalence. In our population the heterosexual spread of HIV-2 is significantly slower than that of HIV-1, which strongly suggests differences in the virus's infectivity potential.

Both HIV 1 and HIV 2 prevalence (HIV-D prevalence) are increasing now-a-days especially in commercial sex workers. In this HIV dual infection prevalence is 0.28%.

Table.1 Year wise distribution of total number of HIV positives

Year	Total tested	Total Positives	Total Negatives
2011	10588	1812	8776
2012	8683	1158	7525
2013	10215	1713	8502

Table.2 HIV 1 and HIV 2 and HIV 1 & 2 distribution

Year	Total Positives	HIV 1	HIV 2	HIV 1 & 2	Indeterminate
2011	1812	1735	51	26	Nil
2012	1158	1101	36	21	Nil
2013	1713	1617	60	36	Nil
Total	4683	4453	147	83	0

Table.3 Sex wise distribution of HIV-1, HIV-2 and HIV-1 & 2

Sex	HIV 1	HIV 2	HIV 1 & 2
Male	2479	86	52
Female	1974`	61	31
Total	4453	147	83

Fig.1 HIV positive cases distribution
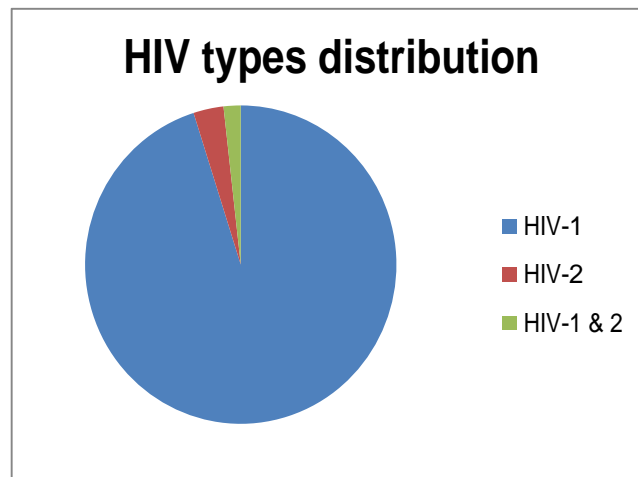
In Guinea-Bissau in the late 1980s the HIV-D prevalence and subsequently declined, at the same time as HIV-2 prevalence decreased (Wilkins *et al.,* 1993; Mansson *et al.,* 2007; Da Silva *et al.,* 2008). A data from a hospital in southern India showed a stable HIV-2 prevalence (2.5% of all HIV-positive cases) and an HIV-D prevalence that declined from 0.8 to 0.4% (of all HIV-positive cases) between 1993-1997 and 2000 − 2001 (Kannangai *et al.,* 2003; Kannangai *et al.,* 1999). HIV-D prevalence among pregnant women in Zimbabwe was reported to be 7.6% in 1994-1995 (Mbizyo *et al.,*

1996) and (a surprisingly low) 0.9% in 1997-1999 (Humphrey *et al.,* 2007).

Solomon *et al.* (1998) observed that the HIV-1 antibodies were found in 7.4% of urban and 7.0% of rural population; HIV-2 antibodies were found in 0.8% of urban and 0.3% of rural population. Chaira and colleagues (2010) highlight the fact that in India, even the first step of incorporating HIV-2 diagnosis into national testing algorithms has not yet been taken.

In this study we conclude that HIV-1 is more prevalent than HIV-2. Both HIV-1 and HIV-2 prevalence indicates that chances of progressing to AIDS is more. Need to educate and create awareness among people to stop the spread of HIV infection in the community. Motivate them for usage of condoms and early diagnosis along with antiretroviral therapy. Empowering women to prevent the infection from partner is necessary.

Acknowledgement

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