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Microbiology

SEROPREVALENCE OF HIV-1 AND HIV-2 AT A TERTIARY HEALTH CARE CENTER IN ANDHRA PRADESH

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ABSTRACT **Introduction:** Human immunodeficiency virus (HIV) attacks the host immune system causing Acquired immunodeficiency syndrome (AIDS) at the most advanced stage of the infection. There are two main types of HIV-- HIV-1 and HIV-2 both of which can lead to AIDS. Objective: To estimate the seroprevalence of HIV-1, HIV-2 and both HIV-1 & 2 at our center. **Materials & Methods:** A prospective analysis of data was done from January 2024 to August 2024 at our Integrated Counselling and Testing Center (ICTC) Government General Hospital, Guntur. All patients diagnosed as HIV infected using NACO testing strategy were included. Age, Sex, Marital status, Education, Occupation and Risk factors of the patients diagnosed with HIV-2 and both HIV-1 &2 was noted. **Results:** Of the total 14233 patients tested, 602 (4.22%) were positive for HIV antibodies. Among them 314 (52.15%) were males, 276 (45.84%) were females and 13 (2.15%) transgenders. Among the total 602 HIV positive patients, 566 (94.01%) were HIV-1, 33 (5.48%) were HIV-2, and 3 (0.49%) were HIV 1&2 positive. **Conclusion:** The seroprevalence of HIV-1 and HIV-2 in our study is in correlation with other areas of south India. Prevalence rate is higher in males. HIV 2 and HIV 1&2 are more common in age group of 40-60 yrs. Therefore, these patients need to be reached through HIV prevention campaigns and testing and counseling programs.

KEYWORDS : HIV-1, HIV-2, Patients living with HIV, ICTC, Seroprevalence, Andhra Pradesh

INTRODUCTION

HIV is a major public health concern, claiming an estimated 42.3 million lives till date. Globally the transmission of HIV is ongoing in almost all countries. At the end of 2023, Patients living with HIV (PLHIV) were estimated to be around 39.9 million people worldwide. According to National Aids Control Organization (NACO) the number of PLHIV in India are estimated at around 24 lakhs in 2021. Southern states have the largest number of PLHIV with Maharashtra, Andhra Pradesh and Karnataka being the top three. Annual new infections are estimated at 62.97 thousand. HIV-1 is more common than HIV-2. The first case of HIV-2 in India was reported from Mumbai in 1991. There are several reports indicating the presence of HIV-2 and both HIV-1 and HIV-2 in India. The promotion of awareness in behavior and client-oriented counselling and testing in India is carried out by the Integrated Counselling and Testing Centers (ICTC) established countrywide. This study was taken up to assess the occurrence of HIV cases and estimate the seroprevalence of HIV-1 & HIV-2 in patients attending the tertiary care hospital.

MATERIALS & METHODS

The study was conducted at the ICTC facility at the Government General Hospital, Guntur / Guntur medical college from January 2024 to August 2024. A total of 14,233 samples which were sent to the laboratory for routine screening for HIV infection were included in the study. All patients were given a pre-test counselling and filled up the Consent form provided by NACO. The blood was allowed to clot and the serum thus separated was subjected to the NACO provided Comb Aids RS Advantage kit and all positives were tested using 2 other kits Standard-Q HIV 1/2 Ab and Tridot Test for differentiation.

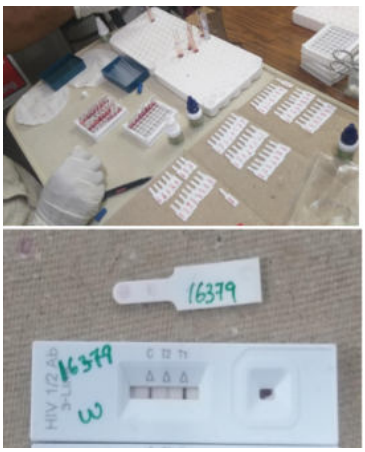

Figure 1: HIV testing done by Comb Aids RS Advantage kit and Standard-Q HIV 1/2 Ab

A Post-test counselling was given for all patients and the results were disclosed following the protocol provided by NACO. HIV reactive patients were further managed with antiretroviral therapy (ART). Patients were followed-up for quality of life and co-morbidities, response to treatment by measuring CD-4 counts & Viral load. Age, sex, marital status, education, occupation, route of transmission of the patients diagnosed with HIV-2 and both HIV-1 &2 were noted. The data thus obtained were charted in Excel and the prevalence were determined.

RESULTS

Of the total 14233 patients tested, (6273 males, 7922 females, and 48 transgenders) 603 (4.23%) were positive for HIV antibodies.

Among them 314 (52.07%) were males, 276 (45.77%) were females and 13 (2.15%) transgenders.

Among the total 603 positive patients, 567 (94.02%) were HIV-1, 33 (5.47%) were HIV-2, and 3 (0.49%) were HIV 1&2 positive.

Prevalence of HIV is higher in males than females whereas Prevalence of HIV-2 and HIV-1&2 is almost equal in males and females. HIV 2 and HIV 1&2 are more common in age group of 41-50 yrs.

Prevalence of HIV is comparatively more in non-literate people and labourers by occupation.

Prevalence is higher in married persons followed by widowed and divorced/separated.

Heterosexual route through regular partner is common followed by commercial and non-regular partners.

DISCUSSION

HIV-1 and HIV-2 share many similarities including their basic gene arrangement, modes of transmission, intracellular replication pathways and clinical consequences: both result in AIDS. However, HIV-2 is characterized by lower transmissibility and reduced likelihood of progression to AIDS. The mode of infection of HIV-1 & HIV-2 appears to be similar. But transmission of HIV-2 is mainly by sexual contact followed by transfusion of infected blood.

The spread of HIV-2 infection is claimed to be mostly limited to Western parts of Africa. It's currently seen in different continents, due to the history of frequent sexual contact of the foreigners with

commercial sex workers (CSW). They act as a means for transmitting HIV-2 from higher prevalent areas, such as parts of West Africa, to lower prevalent countries, like India.

TABLE - 1: Seroprevalence of HIV-1 and HIV-2 in present study v/s other studies

	HIV-1	HIV-2	HIV-1 & 2
Present study Guntur 2024	94 %	5.5 %	0.5%
Y Valentina et al. Pondicherry 2022	95.1%	4.9%	-
Jutang babat et al. Mangalore 2019	95.8%	2.8%	1.4%
Pragati sharma et al. Central India 2019	99%	0.67%	0.33%
Goel V et al. North India 2016	99.3%	0.7%	-
Nayana et al. Mumbai 2013	99.7%	0.14%	0.08%

Seroprevalence of HIV-2 and HIV-1 & 2 co-infection is increasing over a period of time. Patients with HIV-2 and HIV-1&2 co-infection are responding well to antiretroviral therapy (ART). Quality of life, rate of progression to AIDS and mortality is less when compared to HIV-1 positive patients. HIV-2 is found to progress at higher CD-4 counts.

Most common age group was 40-50 yrs. similar to other studies. Slow progression and late manifestation of AIDS in HIV-2 patients is the main cause that prevalence is more in elderly age group. Though prevalence of HIV in general is higher in males, HIV-2 and HIV-1 & 2 coinfections are equally prevalent in males and females. This is due to most of the married women acquiring infection from their regular sex partner (spouse) and HIV-2 only being spread by sexual transmission.

HIV-2 is intrinsically resistant to NNRTI such as nevirapine and efavirenz and not all protease inhibitors (PI) provide good viral suppression. There has been a change in treatment strategy of HIV infection worldwide. Earlier the ART given under National Aids Control Program (NACP) consists of a combination of two nucleoside reverse transcriptase inhibitors (NRTI) and one non-nucleoside reverse transcriptase inhibitor (NNRTI). Now Dolutegravir (Integrase inhibitor) has been added.

Tenofovir 300 mg + Lamivudine 300 mg + DOLUTEGRAVIR 50 mg regimen (TLD) as FDC in a single pill once a day. Dolutegravir is currently the preferred drug in the first-line and also in second-line treatment regimens. DTG-based regimens can be prescribed for PLHIV infected with HIV-2 or combined HIV-1 and HIV-2.

CONCLUSIONS

People below poverty line, non-literate and labourers of middle age need to be reached through HIV prevention campaigns and testing and counseling programs. We conclude that the incidence of HIV-2 and dual infection does occur in our setup and has increased in last few years. To understand the epidemiology and natural history of HIV-2 continuous surveillance is required. It is the need of the hour to differentiate between these two viruses and to assess the exact prevalence and incidence of HIV-2 infection in India so as to frame specific guidelines and treatment modalities for management of HIV-2 infections. Otherwise, we will have to face serious resistant strains of HIV-2 which will possibly pose a problem in our country in the future.

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