

SERO-PREVALENCE OF HIV 1 , HIV 2 AND ITS CO -INFECTION AT TERTIARY CARE CENTRE



Medical Science

KEYWORDS : HIV1 , HIV 2 , Dual infection , Early Diagnosis , drug resistance

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ABSTRACT

INTRODUCTION

AIDS (ACQUIRED IMMUNODEFICIENCY SYNDROME) is a pandemic disease and a disease which has enormous social, economic, and behavioural impact on individuals, families, communities and the whole world. AIDS caused by Human immunodeficiency viruses (HIV) belongs to the family retroviridae and subfamily lentivirinae. India is the first country outside Africa where an HIV-2 epidemic is running in parallel to an HIV-1 epidemic, resulting in a significant proportion of HIV1 and 2 co-infection.

OBJECTIVE

To study Prevalence of HIV1, HIV2 and HIV1 and 2 co infection in patients coming to tertiary care hospital.

Material and methods

In our laboratory HIV testing is done according to NACO guidelines. If the Sample is non reactive for ELISA or rapid HIV test then sample is to be considered as if free of HIV and sample is reactive for HIV then confirmation is done by 2 different kits with different antigen system and / or different principle of test. In our study we confirm the reactive samples for HIV infection by ELISA, TRIDOT PLUS and QUALPRO. We use QUALPRO and TRIDOT PLUS as differentiating test between HIV 1 and HIV 2 infection.

RESULTS

We have done serological test of 50728 samples received from July 2014 to June 2015. Out of these 1293 samples were positive for HIV. Amongst these 1284(2.53%) were HIV1 seropositive patient, 7 (0.014%) were HIV2 seropositive and 2(0.004%) were dually reactive to HIV1 and HIV2.

CONCLUSIONS

HIV-1 is the major cause of AIDS. So early diagnosis and initiation of ART of HIV in affecting person is necessary for healthy life for many years and to delay the symptoms of AIDS. The line of treatment for HIV 1 and HIV 2 is different. So early diagnosis of HIV 1, HIV 2, HIV 1 and 2 co-infection is necessary to initiate treatment which is preventing drug resistance.

INTRODUCTION

AIDS (ACQUIRED IMMUNODEFICIENCY SYNDROME) is a pandemic disease and a disease which has enormous social, economic, and behavioural impact on individuals, families, communities and the whole world. AIDS caused by Human immunodeficiency viruses (HIV) belongs to the family retroviridae and subfamily lentivirinae. AIDS was officially recognised for the first time in June, 1981 at Centers for Disease Control, U.S.A. in previously healthy homosexual men dying with pneumocystis jirovecii pneumonia and candidiasis. Since then, AIDS has been reported from all the continents. The international committee on nomenclature of Viruses named it "Human Immunodeficiency Virus"(HIV) and to date type, HIV 1 and HIV 2 are identified. [1] Since the human immunodeficiency virus (HIV) was found in Chennai in 1986, India has had an AIDS epidemic. India has a population of more than 1.1 billion people -- one sixth of the world's population -- and is home to perhaps one of every eight people with HIV infection. According to Denis Broun, the country coordinator for the Joint United Nations Program on HIV/AIDS (UNAIDS) in India, "It is not possible to control the overall HIV epidemic if it is out of control in India. Whatever success is recorded in India will immediately have an impact on the overall world situation just because of the sheer numbers." [2] Although only about 0.7% of its population is infected with HIV, it has more cases than any other country in the world, with more than 4.5 million HIV-seropositive patients. [3]. We conducted study on seroprevalence of HIV 1 HIV 2 and HIV 1 and HIV 2 co infection in patients admitted at tertiary care centre.

Material and Method

In our laboratory HIV testing is done according to NACO guidelines. Samples were collected in plain vacuette after taking written informed consent of the patients by clinicians. All the

samples were tested by ELISA (Enzyme-linked immunosorbent assay- ENZAIDS) [fig1]. If the samples were non reactive by ELISA then samples were considered to be nonreactive for HIV. HIV Reactive samples with ELISA were further confirmed by 2 different kits with different antigen system and / or different principle of test. In our study the HIV reactive samples were further tested by Rapid QUALPRO (Retroscreen- Immunochromatography) [fig 2] and Tridot plus rapid test (J-Mitra Sandwich immunoassay) [fig3]. We use Rapid QUALPRO and Tridot plus rapid test as differentiating test between HIV 1 and HIV 2 infection. Samples reactive for HIV 2 or both HIV 1 and HIV 2 were confirmed by Western blot.

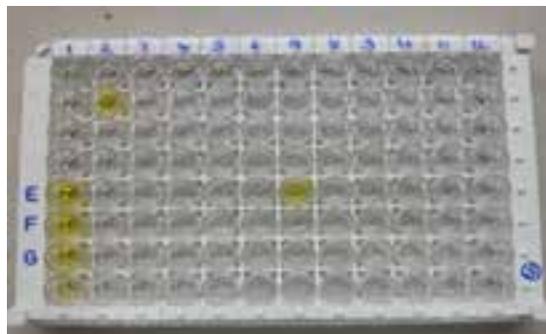


FIG1: ELISA FOR HIV



FIG2: QUALPRO FOR CONFIRMATION AND DIFFERENTIATION OF HIV 1 AND HIV2



FIG3:TRIDOT PLUS FOR CONFIRMATION AND DIFFERENTIATION OF HIV 1 AND HIV2

Result

Total 50728 samples were received in our laboratory from July 2014 to June 2015. Out of these 1293 samples were positive for HIV. Amongst these 1284(2.53%) were HIV 1 seropositive, 7 (0.014%) were HIV 2 seropositive and 2(0.004%) were dually reactive to HIV1 and HIV2.

In HIV 1 seropositive patients following is the age and sex wise prevalence:

AGE GROUP	TOTAL SAMPLES	TOTAL REACTIVE	MALE	FEMALE
0-20 YEARS	6669	79(0.16%)	56	23
21-40 YEARS	22781	726(1.43%)	439	287
41-60 YEARS	14406	436((0.86%)	317	119
>60 YEARS	6872	43(0.084%)	29	15
TOTAL	50728	1284(2.53%)	841(65.5%)	444(34.6%)

Our result indicating highest prevalence of HIV in sexually active age group (1.43%)between 21 to 40 years and HIV reactive rate is more in male than female .

7 samples were positive for HIV 2. Out of which 4 were males and 3 were females. In our study we find that these all 7 positive cases were between 40 to 60 years.

For HIV1 and HIV 2 co infection , 2 samples were found reactive for both. And out of these 2 one was male and other was female of 20 to 40 years of age group.

Discussion

HIV1 and HIV2 are very closely related but differ in antigens and molecular level, pathogenicity , natural history and therapy. HIV 1 is easily transmitted and consequently accounts for vast majority of global HIV infection .Less transmissible HIV 2 was thought to be largely confined to West Africa from where it originated but has spread to parts of Europe and India.[4]

Between HIV 1 and HIV 2 there is variation in antigens and molecule. . Envelope antigens of two types are different, though their core polypeptides show some cross reactivity. HIV 2 has only 40% genetic identity with HIV 1 . It closely resembles simian

immunodeficiency virus than HIV 1. HIV 2 is less virulent than HIV1. Transmission of HIV occurs by sexual intercourse, blood and blood product, tissue and injuries , mother to baby by trans placental route. [5]

In Ouattara et al study 2,578 serum samples were examined.. Amongst which 313 were HIV antibodies carriers, the frequency of HIV1 infection 173 (6.7%) was higher than HIV2 infection 52 (2%). However, 88 (3.4%) had a double seropositive for HIV1 and HIV2

In our study out of 50728 samples 1293 samples are HIV antibodies carriers, HIV1 infection 1284(2.53%) was higher than HIV2 infection 7(0.014%) and 2(0.004%) had a double seropositive HIV1 and HIV2 [6]

PVK et al found out of 2246 samples HIV 1 prevalence was 72 (3.02%) and HIV 2 prevalence was 2(0.09%) with dual infection prevalence being 2(0.09%) , correlating with our study which have HIV 1 prevalence 2.53%, HIV 2 0.014% and HIV 1 and 2 dual infection prevalence is 0.004%. [7]

According to NACP phase 1 and phase 2 states of INDIA were divided in to three categories based on HIV in general population and High risk group .

- 1)High prevalence state:
 - (a)HIV prevalence >5% in highrisk group
 - (b)HIV prevalence >1% among low risk behaviour ex. Antenatal mother

Andhra Pradesh, Tamil Nadu, Maharashtra, Karnataka, and Manipur are classified as high prevalence States

- 2) Medium/low prevalence state:
 - (a)HIV prevalence >5% in highrisk group
 - (b)HIV prevalence <1% among low risk behaviour ex. Antenatal mother
- Gujarat , Goa, Pondicherry ,delhi

- 3) Vulnerable states:
 - (a)HIV prevalence <5% in highrisk group
 - (b)HIV prevalence <1% among Antenatal mother in all sites during last 3 years

In our study 1293 samples were reactive amongst total 50728 samples whereas 9888 patients came under high risk group with prevalence of HIV being 516(5.21%). Out of total 50728 samples 7540 were antenatal mothers of which 21 (0.28%) were reactive. According to NACP Gujarat state is under low prevalence state Our study also correlate with NACP categorization [8] [9]

According to Sheela Godbole & Sanjay Mehendale’s study the prevalence of HIV in pune ,Maharashtra in high risk group is 21.2% and ANC mothers is 1.2% . According to our study prevalence of HIV in high risk group is 5.21% and ANC mother is 0.28%.Hence we can conclude that Pune , Maharasta is high prevalent state and Gujarat is low prevalent state and there is geographical variation.[10]

Antiretro viruse therapy:

Early diagnosis of HIV2 and HIV dual infection is very necessary because ART recommended for HIV 1 is two NNRTI + one NRTI or PI. NNRTIs block reverse transcription through a specific binding site that is not present in HIV2. So this class of drugs will not be effective against HIV2 and co infection. HIV 2 viruse is inherently resistance to NNRTI.

For HIV 2 and HIV1 and 2 dual infection two NRTI+ one PI regime is recommended [4]

CONCLUSION

HIV-1 is the major cause of AIDS . Early diagnosis is necessary to provide access to effective first- line ART regimens for HIV-1, HIV-2 and dual infections in order to avoid the development of viral resistance that will compromise future therapeutic options particularly for HIV-2 and encourage High risk group people at sexually active age group for voluntary counselling at ICTC and VCTC centre. HIV-1 is the major cause of AIDS .

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