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Seroprevalence of Syphilis in HIV positive Patients

KEYWORDS: Window period, HIV, Syphilis, CD 4

Sureena Chauhan	* Seema Srivastava	Geeta Parihar
	Associate Professor, Department of Zoology, University of Rajasthan, Jaipur-India. * corresponding author	Professor and Head, Department of Microbiology, JLN Medical College, Ajmer, Rajasthan

ABSTRACT *Syphilis is a sexually transmitted disease caused by a type of bacteria known as Spirochete, which occurs only in human beings. It is extremely small and can live almost anywhere in the body. The incidence of syphilis is rising all over the world partly due to the increased transmission in HIV and other high risk groups such as sex among the same sex. Syphilis itself facilitates HIV infection in several ways. AIDS/HIV caused by retro virus also has one of the modes of transmission by sexual contact. The present study aims to find out manifestation of syphilis in the context of HIV infected patients. Secondly to find out the age group and sex more prone to syphilis-HIV co infection as untreated syphilis can also cause major birth defects if the pregnant woman suffering from the disease and has not been effectively treated for the studies than the females and between the age group 26-35 years i.e. the reproductively active age group.*

INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) was first recognized in USA in 1981. In India the first cause of HIV/AIDS was reported in 1986 from Chennai in a commercial sex worker. Human immunodeficiency virus belongs to class of Retro virus and sub family lentivirinidae. It is rapidly mutating virus.

Syphilis a sexually transmitted disease (STD) caused by a type of bacteria known as Spirochete -Treponema palladium which occurs only in human beings. It is extremely small and can live anywhere in the body. The treponema enters the body through minute abrasions on the skin or mucosa. The infection can also be passed from a mother to her baby during pregnancy.

HIV and syphilis affect similar patient groups and co infection is common. Detection and treatment of syphilis can therefore help to reduce HIV transmission.

In both the sexes, T. palladium can spread throughout the whole body, infecting major organ. Brain damage and other serious health problems can occur most of are difficult to treat. Untreated syphilis disease of pregnant woman can also cause major birth defects. Syphilis also increases the risk of HIV infection because HIV can enter the body more easily when there is a sore present.

Early stages of syphilis are easily cured with antibiotics. Someone who has been infected for a while will need treatment for a longer period of time. Unfortunately, damaged to the body from the late stage of syphilis cannot be treated. Relapse of infection is more likely in the HIV positive patient and careful follow up is required.

Mode of infection/Transmission

HIV is transmitted by both homosexual and heterosexual contact, by blood and blood products, and by infected mothers to infants either intrapartum perinatal or via breast milk.

HIV infection is predominantly a sexually transmitted disease (STD). The virus appears to concentrate in the seminal fluid, particularly in situations where there are increased numbers of lymphocyte and monocyte in the fluid, as in genital inflammatory states such as urethritis and epididymitis conditions closely associated with other STD. The risk of acquiring HIV infection enhances if genital ulcers are present as in syphilis or chancroid.

The Spirochetes causing syphilis can pass from one person to another through direct contact with syphilis sore during sexual intercourse. The infection can also be passed from a mother to her baby during pregnancy. HIV and syphilis co-infection is also common among voluntary and replacement donors.

Symptoms of syphilis

The spirochete produces a classic, painless ulcer known as a chancre. There are three stages of syphilis, along with an inactive (latent) stage. Formation of an ulcer (chancre) is the first stage, with an average time of 21 days following infection is highly contagious when the ulcer is present. In most women, an early infection resolves on its own, even without treatment. However, 25% will proceed to the second stage of the infection called "secondary" syphilis, which develops weeks to months after the primary stage and lasts from four to six weeks. Secondary syphilis is a systemic stage of the disease, meaning that it can involve various organ systems of the body. In this stage, patients can initially experience many different symptoms, like skin rash, hair loss, sore throat, white patches in the nose, mouth, and vagina, fever, and headaches. There can be lesions on the genitals that look like genital warts but are caused by spirochetes rather than the wart virus Subsequent to secondary syphilis, some patients will continue to carry the infection in their body without symptoms. This is the so-called latent stage of the infection. Then, with or without a latent stage, which can last as long as 20 or more years, the third (tertiary) stage of the disease can develop. At this stage, syphilis usually is no longer contagious. Tertiary syphilis is also a systemic stage of the disease and can cause a variety of problems throughout the body including: heart problems, the development of large nodules (gummas) in various organs of the body; infection of the brain (stroke, mental confusion, meningitis), problems with sensation, or weakness (neurosyphilis); involvement of the eyes leading to sight deterioration; or involvement of the ears resulting in deafness. The damage sustained by the body during the tertiary stage of syphilis is severe and can even be fatal.

HIV and Syphilis

HIV and Syphilis are often seen as co- infections since they share a common mode of transmission. During episode of Syphilis ,CD4 counts transiently decrease and HIV viral load increase.

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Genital sores (chancres) caused by syphilis make it easier to transmit and acquire HIV infection sexually. There is an estimated 2 to 5 fold increased risk of acquiring HIV if exposed to that infection when syphilis is present. Ulcerative STD that cause sores, ulcers or break in the skin or mucous membrane such as syphilis disrupts barriers that provide protection.

OBJECTIVES OF THE STUDY

- Identification of HIV patients.
- Co infection of syphilis in HIV patients.
- To find out the age more prone to such co infections.

MATERIALS & METHODS

Part A- Confirmation of HIV

Experiment 1

A third generation sandwich ELISA (Enz Aids HIV ½) test was used for the detection of antibodies to HIV-1 and HIV-2 in serum/plasma. 1 blank, 3 negative controls and 2 positive controls were used in the test. Negative and positive control was compared with test sample. According to the guidelines provided by NACO If Absorbance value is less than the cut off value than it should be considered non reactive and if absorbance value is greater, than cut off value should be considered reactive.(Guideline by NACO)

Experiment 2

Screening of antibodies to HIV type 1 and 2 was carried out using comb aid assay. Test is based on Immunoconcentration assay. Test is based on Immunoconcentration assay. Device employs solid phase capture technology, which involves the immobilization of HIV Antigen on porous membrane (Guideline by NACO).

Experiment 3

Third test was SD BIO LINE HIV1 & 2(Rapid test for HIV) based on Immunochromatography (lateral flow) assay.

Part-B- Test for Association of HIV positive & Syphilis patients.

Diagnosis of syphilis in HIV positive patients by VDRL (RPR test).

PRINCIPLE

Syphilis is a sexually transmitted (venereal) disease caused by the spirochete Treponema palladium . After infection the host forms Treponemal antibodies to Treponema palladium, in addition, the host also forms Non Treponemal antilipoidal antibodies in response to the lipoidal material released from the damaged host cell. These antibodies are traditionally referred as 'Reagins'. The Rapid Plasma Reagin (RPR)/ Carbon Antigen test is a macroscopic non Treponemal flocculation test for the detection and quantization of anti lipoidal . Non-Treponemal tests like CARBOGEN are of great value when used for screening and follow up of therapy.

During the testing procedure, the specimen, serum or plasma is mixed with the CARBOGEN reagent and allowed to react for eight minutes. If antilipoidal antibodies are present in the specimen, they will react with the CARBOGEN reagent forming visible black floccules. If antilipoidal are not present in the specimen, there will be no flocculation.

Observations

Total 256 samples were collected from patients attending Jawaharlal Nehru Hospital Ajmer were screened for syphilis & HIV. Out of 256 infected patients, there are 26 cases of syphilis. Seroprevelence is highest in age group 26-35 years

TABLE-1

Prevalence of Syphilis among various Age groups-

Age group	Number	Percentage %
0-15	2	7.69%
16-25	7	26.92%
26-35	8	30.76%
36-45	7	26.92%
46-55	2	7.69%
>55	0	0%
Total	26	

Out of 256 HIV infected patients ,there are 26 cases of Syphilis .Seroprevalence is highest in Age group -26-35 years.

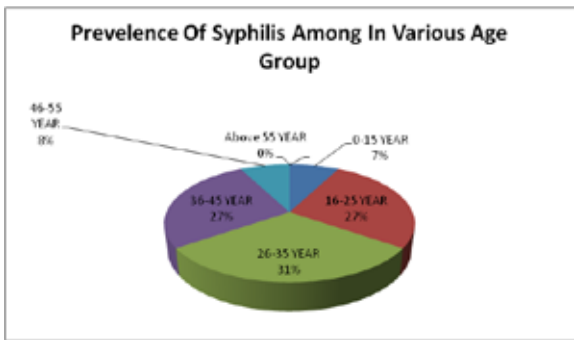

Table -2

Prevalence of Syphilis among different Sex group-

Gender	Number	Percentage %
Male	19	73.07%
Female	7	26.92%

Prevalence of Syphilis among Male patients higher73.07 % than Female.

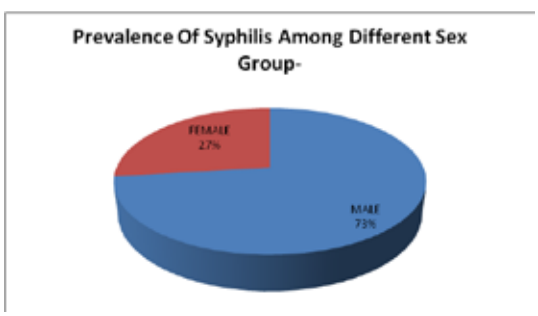

Table-3

Mode of Transmission of Syphilis among HIV positive patients.

Mode of Transmission	Number	Percentage
Needle injury	0	0%
Sexual Transmission	23	88.46%
Patient to child Transmission	3	11.53%
Blood Transfusion	0	0%

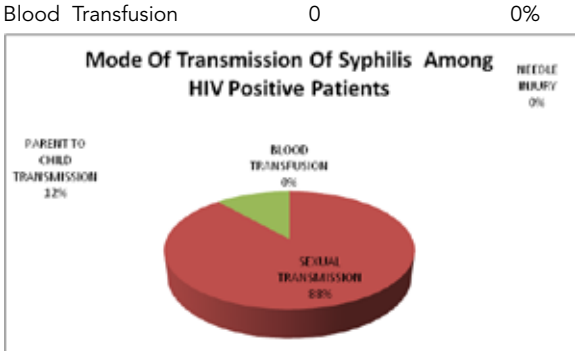

Table-4

Mode of Transmission of HIV positive patients.

Mode of Transmission	Number	Percentage
Needle injury	12	4.68%
Sexual Transmission	220	85.93%
Patient to child Transmission	24	9.37%
Transfusion	0	0%

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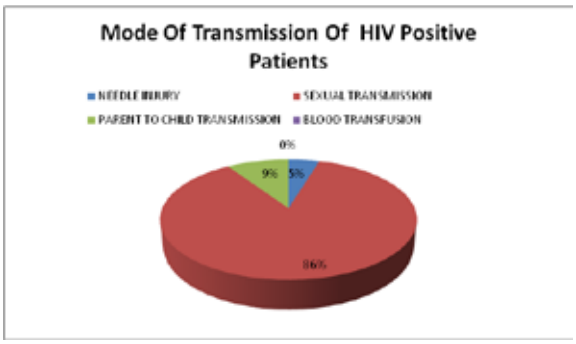
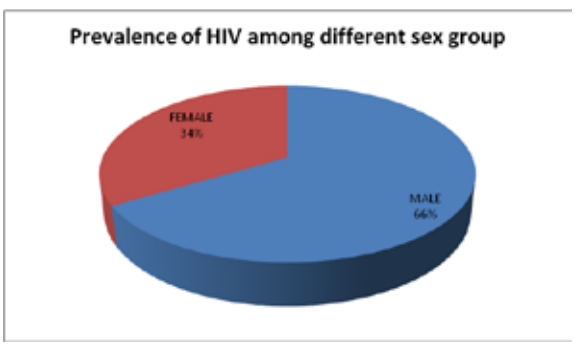


TABLE-5
Prevalence of HIV among different sex group

Gender	Number	Percentage
Male	170	66.40%
Female	86	33.59%



`Prevalence of HIV among Male patients is higher than Female patients.

DISCUSSION

Syphilis is a complex disease, which is sexually transmitted. The incidence of syphilis is rising all over the world, partly due to the increased transmission in HIV patients. Recognition of both the diseases and their complex interactions need importance and cautious treatment as manifestations of syphilis in co infection with HIV make difficult diagnosis, management and cure, with various problems leading due to the co infection.

It is clear that apart from other infections, HIV infected individuals have high probability of getting co infected with syphilis. Multiple infection pose a small but definite risk to the recipients of blood product, voluntary donation are safer as compared with replacement ones and need to be encouraged (Kaur et al., 2010).

Mathai et al., 2002 reported that 31942 donors screened over a 6 year period, m mixed infections were seen in only 10 donors (0.03%).

Kaur et al., 2010 found that Syphilis infection can increase the susceptibility to HIV infection. HIV can alter the clinical course of Syphilis, increase the likelihood of relapse and co-found the diagnosis of neurosyphilis.

Swai and colleagues had reported age specific seroprevalence of Syphilis, in which the individual on the higher age group had higher seroprevalence.

Having Syphilis once does not protect a person from getting it again. Following successful treatment, people can still be susceptible to re infection ,because syphilis sores can be hidden in the vagina , rectum, or mouth it may not be obvious that a sex partner has syphilis.

The surest way to avoid transmission of sexually transmitted diseases, including syphilis is to abstain from sexual contact or to be in a long term mutually monogamous relationship with a partner who has been tested and is known to be uninfected.

Rate of infection have increased since the turn of millennium in many countries often in combination with HIV .This has been attributed partly to unsafe sexual practices among men who have sex with men ,increased promiscuity, prostitute.

Congenital syphilis in the new born can be prevented by screening mothers during early pregnancy and treating those who are infected. World Health Organization (WHO) recommends that all women are tested at their first antenatal visit and again in third trimester. If they are positive they recommend that their partners also be treated. A number of measures to increase access to testing appear effective at reducing rates of congenital syphilis in low to middle groups.

Failure to diagnose and treat these devastating disease agents at an early stage may result in serious complications and sequlae including infertility, fetal wastage, ectopic pregnancy, and genital cancer and premature death as well as neonatal and infant infection (WHO Guideline,2003). HIV seropositivity was higher among the subjects aged between 15-34 years. This may be associated with higher sexual activities within these age groups. This suggests that women who are at the peak of their reproductive years are more prone to HIV infection. In all epidemiological studies, younger age has always proved to be the most important factors .The age of acquiring the infection is the major determinant of the incidence and prevalence rates. Since HIV prevalence among young pregnant women (15-24 years) is used as a proxy for measuring rates of new infections in population(Federal Ministry of Health Nigeria,Report,2009).A risky sexual behavior are very common in India, while condom use remain low. The implications of HIV infection in pregnancy are serious. HIV seropositive pregnant women are significantly more likely to have recurrent vulvovaginitis , perineal tear, post partum hemorrhage, birth asphyxia and increased perinatal mortality(Obi.,2005) .There is also great risk of vertical transmission during parturition and breast feeding(Fawole et al.,2002). Swai and colleagues reported age specific seroprevalence of syphilis ,in which the individual in the higher age group had higher seroprevalence . It seems that people start having unprotected sex at young age and have extramarital relationships (Swai et al.,2006).

This research work showed that syphilis seroprevalence decreased with increasing level of education. Syphilis has long been known to be an important risk factor for adverse pregnancy out come. The consequences of untreated maternal infection include still birth, pre term live birth and also congenital infection in proportion of surviving infants. Women who work in the commercial sex industry differ from the general population in their increased vulnerability to infection and their potential for increased rate of such infections.

Conclusion

Seroprevalence of Syphilis is highest among Patients between the ages of 26-35 years ,which implies that syphilis infection is more common in adults.

Detection and treatment of syphilis can, therefore help to reduce HIV transmission. Syphilis may present with non typical feature in the HIV positive patients. There is a higher rate of symptomless primary syphilis and proportionately more HIV positive patient present with secondary infection. Secondary infection may be more aggressive and there is an increased rate of early neurological and ophthalmic involvement.

In both the sexes T. palladium can spread throughout the whole body, infecting major organs. Brain damage and other serious health problems can occur, most of them are difficult to be treated. A woman who is pregnant and has not been

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effectively treated is at higher risk of putting her baby in danger. Untreated syphilis can also cause major birth defects. Syphilis also increases the risk of HIV infection because HIV can enter the body more easily when there is a sore present.

Early stages of syphilis can be cured with antibiotics. If some person is infected will be required the treatment for a longer duration. Once the damage occur in the body from the late stage of Syphilis, it is difficult to treat.

All HIV positive patients should be treated with penicillin based regimen that is adequate for the treatment of neurosyphilis. Relapses are more likely to occur in HIV positive patient and careful follow up is required.

We believe our data could help health professionals to deal better with co-infection with Syphilis in HIV infected patients. We also believe our data reinforces the need of prevention programs, which also lead to reduction in prevalence of syphilis in HIV infected patients.

Acknowledgement
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