



## PREVALENCE OF SYPHILIS IN HIV REACTIVE PATIENTS ATTENDING TERTIARY CARE HOSPITAL, BHAVNAGAR

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### ABSTRACT

**Introduction:** Syphilis is a sexually transmitted infection caused by spirochete bacterium called *Treponema pallidum*. Syphilis facilitates the transmission and acquisition of human immunodeficiency virus (HIV) and causes transient increase in the viral load. HIV has several effects on the clinical presentation and diagnosis of syphilis as there is rapid progression to late stage syphilis even after treatment of primary and secondary syphilis. Aim: Aim of the study was to estimate seroprevalence of syphilis in HIV reactive patients. **Study design:** This is a Retrospective study. Place of study: This study was conducted in Microbiology Laboratory at Sir Takhtsinhji Hospital, Bhavnagar. **Methodology:** Total 142 HIV reactive samples received in ICTC Centre were screened for RPR (Rapid Plasma Reagin) test from January 2021 to December 2021 performed by Slide Flocculation card test. All reactive samples were confirmed by *Treponema pallidum* Hemagglutination Assay (TPHA). Results: Out of 142 HIV seroreactive samples 6 (4.22 %) were reactive for syphilis by both RPR and TPHA test. and Out of 6 seroreactive samples, 5 (83.3%) were males and 1 (16.7%) were female. higher in 20-30 years (50%) followed by 31-40 years (33.3%) followed by 41-59 (16.7%) years age group. **Conclusions:** Results of this study indicate higher prevalence of syphilis among HIV-infected people. Thus, intervention measures targeting HIV-infected individuals would have paramount importance to prevent transmission of syphilis as well as HIV. The present study have suggested that in HIV reactive person further counselling and screening for Syphilis testing helps in proper management of patients having Syphilis and HIV co infection and complications of both infection.

### KEYWORDS : HIV, RPR, Syphilis, TPHA

#### INTRODUCTION:

Syphilis is one of the sexually transmitted disease, caused by spirochete bacterium called *Treponema Pallidum* which was discovered by Fritz Schaudinn and Erich Hoffmann in 1905 in the chancres and inguinal lymph nodes of syphilitic patients.<sup>[1]</sup> In India, in 1970s and early 1980s Syphilis and Chancroid were the main causes of sexually transmitted infection and in late 1980s, the pattern of sexually transmitted infection has been shifted from bacterial to viral after identification of Human Immunodeficiency virus (HIV) infection.<sup>[2]</sup> Syphilis still remains a significant health problem globally. The incidence of syphilis is estimated 11 million per year globally.<sup>[3]</sup>

Interaction between syphilis and HIV infection is complex. Concurrent infection with *Treponema Pallidum* and HIV is common and may lead to earlier evolution of neurosyphilis. Syphilis increases the risk of HIV acquisition through abraded mucosa by causing genital ulcers and it increases HIV transmission among HIV patients by increasing the amount of viral shedding.<sup>[4]</sup> HIV has several effects on the clinical presentation and diagnosis of syphilis as there is rapid progression to late stage syphilis even after treatment of primary and secondary syphilis. Studies demonstrated that individuals with sexually transmitted infections (STI) like syphilis are 3-5 times more likely to acquire HIV infection, if they exposed to the virus through sexual contact.<sup>[5]</sup>

The Diagnosis of syphilis is dependent on clinical signs, direct demonstration of bacilli by Dark ground microscope, Polymerase chain reaction (PCR) and detection of antibodies by serology.<sup>[6]</sup> Serological tests are: nonspecific tests like rapid plasma reagin test (RPR), venereal disease research laboratory (VDRL), and specific tests like *treponema pallidum* immobilization test (TPI), fluorescent *treponema* antibody absorption test (FTA ABS) and *treponema pallidum* hemagglutination assay (TPHA).<sup>[7]</sup> Rapid Plasma Reagin test which detect Non-specific Antibodies against Syphilis

infection is most widely used screening test due to its simplicity and low cost. In HIV infected patients, unusual serological responses like high titers have been reported with nonspecific tests. Therefore, specific tests should always be done in all HIV reactive patients.<sup>[8]</sup>

#### AIM AND OBJECTIVES:

Aim of the study was to estimate seroprevalence of syphilis in HIV reactive patients.

#### MATERIALS AND METHODS:

The study was conducted in Microbiology Laboratory at Sir Takhtsinhji Hospital, Bhavnagar from January 2021 to December 2021. Total 10812 blood samples received from ICTC (Integrated counselling and Testing Centre) for HIV testing after taking consent for HIV testing. All patients attending ICTC were given a pre-test counselling regarding HIV, its route of transmission, preventive measures and treatment modalities.

#### Inclusion criteria

- Patients with HIV infection with all age groups and both sexes.

#### Exclusion criteria

- Patients without HIV infection.
- HIV reactive persons who do not suggest syphilis infection clinically.

#### Sample collection

- A 3 ml-5 ml venous blood specimen was collected from each patient into a plain vacutainer under sterile aseptic conditions, and allowed to clot for about 10-15 minutes or centrifuged at 3000 rpm for 5 minutes.

#### Processing of samples

- Total 142 samples which were reactive for HIV and suggest

syphilis infection clinically received in ICTC Centre, were screened for non-specific RPR (Rapid Plasma Reagin) test. Test is performed by Slide Flocculation card test. When RPR antigen containing (cardiolipin-lecithin coated cholesterol and fine carbon particles) mixed with patients serum containing regain antibody, flocculation reaction occur which can be seen as a clumps of carbon particle. A standard RPR test with 18 mm circle card (Reckon Diagnostics) was carried out, by mixing one drop of serum with one drop of RPR reagent, on a shaker for 8 minutes, and results were read in good light. RPR was reported as reactive if the clumps were detected and non-reactive if no clumping were seen. Dilution of the reactive samples were prepared with 0.9% physiological saline, the last dilution with visible clumping is the RPR titre of the serum and were reported with 1:1, 1:2, 1:4, 1:8, 1:16...titre.<sup>19,10</sup> RPR test is qualitative as well as semi-quantitative test used for the diagnosis of syphilis.

**Treponema pallidum hemagglutination assay (TPHA) test:**

All RPR reactive samples were confirmed by Specific TPHA (Treponema Pallidum Hemagglutination Assay) test by passive hemagglutination assay which detect anti-treponemal antibodies in serum. TPHA test was performed qualitatively by adding 2-3 drops of serum by using provided disposable sample dropper by ICT method. Results were noted within 5- 15 minutes. Results were recorded as positive, if there were two colored bands one at test region and another at control line region and negative if there was only one colour band at control line region.<sup>11,12</sup>

**RESULTS:**

A total of 10989 patients attended ICTC in 12 months duration were tested for HIV. Out of these, 177 (1.61%) were HIV seroreactive. Among selected 142 HIV seroreactive samples 6 (4.22%) samples were RPR (Rapid Plasma Reagin) Reactive and 136 were RPR (Rapid Plasma Reagin) non-reactive. All these 6 RPR Reactive samples were positive for TPHA (Treponema Pallidum Hemagglutination Assay) test also.

**Table 1: Seropositivity of Syphilis among total HIV reactive samples**

	HIV	Syphilis
Total	10989	142
Reactive	177 (1.61%)	6 (4.22%)
Non- Reactive	10812	136

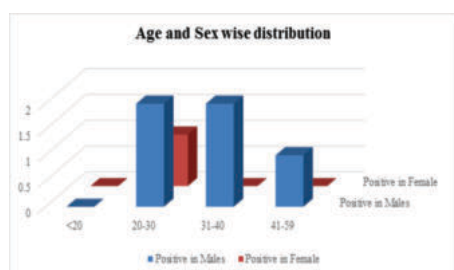
**Table 2: Sex wise distribution of Syphilis.**

	Syphilis Reactive
Male	5 (83.3%)
Female	1 (16.7%)
Total	6

From 6RPR Reactive samples 5 (83.3%) were male and 1 (16.7%) were female suggesting males were more commonly affected than females.

**Table 3: Age wise distribution of Syphilis.**

Age (years)	Total no %
<20	00
20-30	3(50%)
31-40	2(33.3%)
41-59	1 (16.7%)
Total	6



- 3 (50%) of patients were from the age group 20-30 years, 2 (33.3%) were from 31-40 years and 1(16.7%) were from 41- 59 years.

**Table 4: RPR titre.**

Titre	Total No
<1:2	2 (33.3%)
>1:2	4 (66.7%)

- 2 (33.3%) samples show RPR titre <1:2 while RPR titre in other 4 (66.7%) samples were >1:2.

**DISCUSSION:**

Syphilis has a negative impact on HIV infection resulting in decreasing CD4 cell counts during syphilis infection and increasing viral loads. Likewise, HIV has a negative impact on the clinical course of syphilis. Patients with concurrent HIV are to be at increased risk of neurological complications like neurosyphilis and treatment failure.<sup>113</sup>Hence prompt diagnosis of Syphilis in HIV reactive patients is become extremely important.<sup>114</sup> Serological tests for diagnosis of Syphilis may be difficult to interpret in HIV reactive patients because it cause atypical responses such as delayed responses to both treponemal and non-treponemal tests.<sup>115</sup>The HIV reactive individuals included in this study were symptomatic individuals suggesting syphilis infection who had presented to ICTC. Therefore, all HIV positive individuals were not screened in the study to avoid false positive result as there is high chance of false positive result of syphilis in HIV reactive patients according to study done by Maity at el<sup>116</sup> from west Bengal.

In the present study prevalence of syphilis among HIV reactive samples was 4.22 %, which is comparable with study done by Dr. Kiran Bala et al<sup>171</sup> (2.8%) from rohtak and Hiral K Patel et al<sup>181</sup> (6.25%) from valsad. There are scattered reports about prevalence of syphilis and HIV in India, which vary in different population groups of different regions of the country. Studies done in various parts of India, revealed a prevalence of syphilis in high risk individuals varying from 9.07 % in STI (Sexually transmitted infection) patients<sup>191</sup> to 21.9 % in long distance truck drivers.<sup>20</sup> Wide variations in prevalence suggest that no single set of estimates could apply in such a large and diverse country as India. Hence, prevalence rates for a particular area and group of patients need to be assessed, to help health administrator in providing better services for their treatment and control.

In this study 5 (83.3%) were male and 1 (16.7%) were female suggesting males affect more commonly than females compatible with study done by Bala K (76.5%) in males.<sup>17</sup> Male affects more than female due to multiple social and institutional factors like stigmatization, discrimination, and violence across police, community, family, and health care system.<sup>21</sup> Further high risk sexual behavior are seen in men like men to men sex, multiple sexual partner, unprotected sex etc.<sup>22</sup> Prevalence of syphilis is higher in 20-30 years age group (50%) followed by 31-40 years age group (33.3%) which are comparable with study done by Shweta Sharma et al (53.6%).<sup>23</sup> 20-40 years age group are most commonly affected due to more illiteracy, unemployment, marital status and it is a sexually active age group. Further there is more chance to alcohol consumption, drug abuse, and they prefer to stay in group in this age group.<sup>24</sup>

In present study RPR titre reported high of >1:2 which is 66.7%. So we can say that RPR titre are high in HIV reactive patients compared to HIV non- reactive patients as proven by other study done by Kalyani et al<sup>25</sup> from Andhra Pradesh. Further prozone phenomena are seen in RPR giving false negative result hence it is essential to test sera in dilution.<sup>11</sup>

This study has some limitations in light of which results need be interpreted. First, as a hospital based study that used a non-probability sampling method, selection bias may be introduced that hinder the generalizability of the result to all HIV-infected population. Secondly, specific TPHA test was performed only in RPR reactive samples. Sensitivity to RPR is low in late stage of syphilis, so patients remain undiagnosed for syphilis if come with late stage infection.<sup>13</sup> This study involve 1 year duration, so further study may needed to know the exact correlation between syphilis and HIV infection.

**CONCLUSION:**

Results of this study indicate higher prevalence of syphilis among HIV-infected people. Thus, intervention measures targeting HIV-infected individuals would have paramount importance to prevent transmission of syphilis as well as HIV.

The present study have suggested that in HIV reactive person further

counselling and screening for Syphilis testing helps in proper management of patients having Syphilis and HIV co infection and complications of both infection.

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Nil

#### Conflict of Interest:

The authors declare no conflict of interest.

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