

# Trend of Seroprevalence of Syphilis in a Tertiary Care Centre

Maria Jose Pinto<sup>1</sup>, Pradnya Naik<sup>2</sup>

<sup>1</sup>Assistant Lecturer, Department of Microbiology, Goa Medical College, Bambolim, Goa 403202, India.

<sup>2</sup>Associate Professor, Department of Microbiology, Goa Medical College, Bambolim, Goa 403202, India.

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## ABSTRACT

**Background:** Syphilis is a sexually transmitted disease (STD), caused by *Treponema pallidum* subsp. *pallidum*. In this study done in a Tertiary Care Centre, seroprevalence and rising or falling trend of syphilis in different groups among patients was analyzed. Aims: To study trend of seroprevalence of syphilis in a tertiary care centre. **Methods:** A retrospective study was carried over a period of 3 alternate years from 1st May 2012 to 30th April 2013, 1st May 2014 to 30th April 2015 and 1st May 2016 to 30th April 2017. Seroprevalence of syphilis in different patient groups was analyzed by Venereal Disease Research Laboratory (VDRL) and *Treponema Pallidum* Hemagglutination Assay (TPHA). A Rising or falling trend of syphilis seroprevalence was also analyzed. **Results:** Among the 17941 serum samples tested, 504 (2.80%) were found reactive by VDRL test. A total of 1244 were tested by both quantitative VDRL test & TPHA assay. A falling trend of seroprevalence was observed from 1.04% in May 2012-April 2013 to 0.58% in May 2016-April 2017. A falling trend was observed in STD clinic attendees from 7.9% in May 2012-April 2013 to 6.12% in May 2016-April 2017. A seroprevalence of 61.72% was observed in males compared to 38.27% in females. **Conclusion:** A decreasing trend of syphilis was observed over a study period among antenatal women, STD clinic attendees & HIV-seropositive individuals. These findings could be interpreted as indicators of sustained efforts for case detection, treatment and improved programme for prevention & management of STD's.

**Keywords:** Syphilis, Seroprevalence, VDRL, TPHA.

## INTRODUCTION

Syphilis is caused by *Treponema Pallidum* subsp. *Pallidum*. It is a classical example of a sexually transmitted disease (STD) that can be successfully controlled by effective public health measures due to the availability of a sound diagnostic test and effective and economical treatment options. The World Health Organization estimates that 10-12 million new infections of syphilis occur Every year.<sup>[1]</sup> The exact prevalence of syphilis in India is not known because of several reasons viz. the stigma attached to the sexually transmitted diseases (STDs), poor attendance at STD clinics, lack of common registry for reporting STDs, and syndromic management which misses many asymptomatic cases.<sup>[2]</sup>

The present study was aimed at understanding the occurrence of syphilis among various patient groups attending a tertiary care hospital and studying the

trends over a period of three alternate years. In this study done in a tertiary care centre, we analyzed seroprevalence and rising or falling trends of syphilis in different groups among patients.

## MATERIALS AND METHODS

A retrospective study was carried over a period of 3 alternate years from 1st May 2012 to 30th April 2013, 1st May 2014 to 30th April 2015 and 1st May 2016 to 30th April 2017. Sero-prevalence of syphilis in different patient groups based on clinical diagnosis ie. STD patients, antenatal mothers, HIV positive individuals and suspected neurosyphilis patients were analyzed by Venereal Disease Research Laboratory (VDRL) and *Treponema Pallidum* Hemagglutination Assay (TPHA). VDRL and TPHA is efficient combination for exclusion or detection of syphilis in all stages of the disease but may be negative in early primary stage.

Serum samples from all patients were tested by qualitative VDRL using standard procedures. Samples positive for VDRL were subjected to a quantitative VDRL test using serum dilutions from 1 in 2 upto 1 in 64. Samples positive in both tests were designated as seropositive for syphilis. The patients

### Name & Address of Corresponding Author

Dr. Pradnya Naik  
Rich Builders Hill View Apartment,  
UG-2, Block-1,  
Bambolim  
Goa 403202.

were categorized into different groups on the basis of clinical diagnosis and data available in the laboratory registers. Rising or falling trends of syphilis seroprevalence were also analyzed. Trends of syphilis in different patient population were obtained by calculating the percentage positivity during each year.

## RESULTS

Among the 17941 serum samples tested, 504 (2.80%) were found reactive by VDRL test. A total of 1244 were tested by both quantitative VDRL test & TPHA assay with 162(13.62%) patients showing positive seroprevalence. The samples positive by both tests were considered as confirmed positive for syphilis and were analyzed to observe trends of syphilis in this population.

Year-wise trend of seroprevalence is shown in [Table 1].

The syphilis seroprevalence from 14.85% in may 2012-april 2013 to 20.06% in may 2014-april 2015 reduced to 6.34% in may 2016 to april 2017, was statistically significant ( $\chi^2=?$ ,  $P=?$ ). A rising trend of seroprevalence was observed from May 2012-April 2013 to May 2014-April 2015, with a rise in seroprevalence from 0.12% to 0.31% in antenatal clinic attendees; 1.36% to 1.86% in HIV patients and 7.9% to 13.18% in STD attendees. However, in recent years from may 2014-april 2015 to May 2016-April 2017 a falling trend was observed in STD clinic attendees from to 13.18% to 6.12% and in antenatal clinic attendees from 0.31% to 0.02%. A falling trend of seroprevalence was observed among patients from other wards/OPD from 2.75% to 0.58%. A seroprevalence of 61.72% was observed in males compared to 38.27% in females.

The detailed year-wise results for each group are provided in [Table 2].

**Table 1: Year-Wise Trend Of Seroprevalence**

Year	No. tested	No. reactive by VDRL (in %)	No. tested	No. reactive by VDRL and No. positive by TPHA (in %)
May 2016- April 2017	4963	170 (3.42%)	457	29 (6.34%)
May 2014- April 2015	6164	193 (3.13%)	309	62 (20.06%)
May 2012- April 2013	6814	141 (2.06%)	478	71 (14.85%)

**Table 2:**

Subgroups	May 2016- April 2017	May 2014- April 2015	May 2012- April 2013
STD			
No.	359	220	227
Positive	22	29	18
Percentage	6.12%	13.18%	7.9%
ANC			
No.	3463	3526	3937
Positive	1	11	5
Percentage	0.02%	0.31%	0.12%
HIV			
No.	86	214	1755
Positive	0	4	24
Percentage	0	1.86%	0.12%
OPD/WARD			
No.	1018	2144	871
Positive	6	18	24
Percentage	0.58%	0.83 %	2.75%
NEUROSYPHILIS			
No.	135	124	135
Positive	1	0	0
Percentage	0.74%	0	0

## DISCUSSION

Various studies from India have shown varied rates of syphilis depending upon the population study. Seroprevalence rate of syphilis varies in geographic areas and among various groups analysed. Studies from STD clinics have shown seroprevalence ranging from 5.4% to 8.2%.<sup>[3,4]</sup> In a study on STD clinic attendees in North India, there was a significant rise in the incidence of syphilis from 15.8% during 1990 to 24.2% 2004. This has been attributed to socio-economic factors, behavioral changes, and increasing prevalence of AIDS.<sup>[5,6]</sup>

Our study showed a declining rate of syphilis in STD clinics in recent years as well as the overall seroprevalence. These findings could be interpreted as indicators of improved programmes for prevention and management of STDs as well as availability of treatment in STD clinics. A rise in seroprevalence of syphilis was observed in USA, Germany, and Sweden. In USA, the rise in the prevalence has been ascribed to increased number of men who have sex with men (MSM) and reduction in safe sex practices among them.<sup>[7]</sup> While in Europe, the rise is attributed to increased number of

MSM as well as increased testing in high-risk groups.<sup>[8,9]</sup> We could not, though, stratify our cases into primary, secondary, or tertiary syphilis because of lack of complete details of all patients. However, a falling trend was observed at our center in recent years which could possibly be attributed to increased awareness in the public and an increased use of barrier contraceptives.

Only those patients positive by both VDRL and TPPA were analyzed to study the trends of syphilis. This was done to exclude biological false positive phenomenon observed with the VDRL test. The biological false positivity by VDRL test was observed to be 0.27%. The results are similar to another study, where Bala et al looked for the usefulness of TPPA in the diagnosis of syphilis in weak reactive VDRL sera and reported a biological false positivity of 0.2%. They concluded that a confirmatory test such as TPPA should be performed on all sera with a reactive VDRL regardless of its titer.<sup>[10]</sup>

Indian studies on syphilis from antenatal groups has shown a seroprevalence of 0.84% to 0.98%.<sup>[11,12]</sup> However, as syphilis can cause adverse outcomes of pregnancy in 80% of the cases, including stillbirths, abortions, perinatal death and neonatal infections in a significant number of cases, the importance of screening antenatal women for syphilis should always be highlighted.<sup>[13]</sup>

A rise in seroprevalence of syphilis was observed in patients with HIV. While in Western countries, a cocktail of factors like persistent high-risk behavior and increased testing by HIV individuals has resulted in increased detection of syphilis.

Coinfection rates of syphilis and HIV, fortunately, not worrisome in this locality. Co-infection rates of syphilis and HIV have been showing a worrisome trend in several countries, with urban outbreaks in men who have sex with men showing rates of 20%-73%. In India, variable syphilis-HIV coinfection rates have been described.<sup>[14]</sup>

Syphilis and HIV co-infection presents a complex interaction. HIV alters the course of syphilis as well as the response to treatment. Altered serological responses in HIV positive patients also underlines the need for treponemal tests in this patient group. The need for further studies in this area should be overemphasized.

## CONCLUSION

A decreasing trend of syphilis was observed over a study period & among antenatal women, STD clinic attendees & HIV-seropositive individuals in recent years. These findings could be interpreted as indicators of sustained efforts for case detection, treatment and improved programme for prevention & management of STD's.

Our study had several limitations. Its retrospective nature limited evaluation of several parameters like

age-wise distribution, rural and urban population, etc. The results may not reflect the true prevalence of syphilis in the community as this was a hospital-based study. Also, many patients with STDs approach private practitioners, and patients coming to our tertiary care center represent just the tip of this iceberg. Finally, the study looked into short term trends ranging over a period of 3 alternate years. Long term evaluation of these trends will undoubtedly yield more epidemiological data. Nevertheless, findings of this study can help us understand the disease trends at a larger scale. Even though the prevalence of syphilis is on the decline, screening of high risk populations should be continued to avoid the complications of undiagnosed and untreated syphilis.

## REFERENCES

1. World Health Organization, Department of HIV/AIDS Global prevalence and incidence of selected curable sexually transmitted diseases: overview and estimates, World Health Organization, Geneva (2001) [SD-008]
2. Desai VK, Kosambiya JK, Thakor HG, Umrigar DD, Khandwala BR, Bhuyan KK. Prevalence of sexually transmitted infections and performance of STI syndromes against aetiological diagnosis, in female sex workers of red light area in Surat, India. *Sex Transm Infect.* 2003;79:111-5. [PMC free article] [PubMed]
3. Newman L, Kamb M, Hawkes S, Gomez G, Say L, Seuc A, et al. Global estimates of syphilis in pregnancy and associated adverse outcomes: Analysis of multinational antenatal surveillance data. *PLoS Med.* 2013;10:e1001396. [PMC free article] [PubMed]
4. Maity S, Bhunia SC, Biswas S, Saha MK. Syphilis seroprevalence among patients attending a sexually transmitted disease clinic in West Bengal, India. *Jpn J Infect Dis.* 2011;64:506-8. [PubMed]
5. Ray K, Bala M, Gupta SM, Khunger N, Puri P, Muralidhar S, et al. Changing trends in sexually transmitted infections at a Regional STD Centre in North India. *Indian J Med Res.* 2006;124:559-68. [PubMed]
6. NACO Annual Report 2010-2011. 2012:5.
7. CDC. Sexually Transmitted Disease Surveillance 2012. Atlanta: U.S. Department of Health and Human Services; 2013. PHE. Recent Epidemiology of Infectious Syphilis and Congenital Syphilis Health Protection Report. 2013:7.
8. Ray K, Bala M, Gupta SM, Khunger N, Puri P, Muralidhar S, et al. Changing trends in sexually transmitted infections at a Regional STD Centre in North India. *Indian J Med Res.* 2006;124:559-68. [PubMed]
9. Kar HK. Incidence of secondary syphilis on rise and need for a separate flow chart for its syndromic management. *Indian J Sex Transm Dis.* 2004;25:22-5.
10. Bala M, Toor A, Malhotra M, Kakran M, Muralidhar S, Ramesh V. Evaluation of the usefulness of Treponema pallidum hemagglutination test in the diagnosis of syphilis in weak reactive Venereal Disease Research Laboratory sera. *Indian J Sex Transm Dis.* 2012;33:102-6. [PMC free article] [PubMed]
11. BR Archana, SR Prasad, PM Beena, R Okade, SR Sheela, YC Beeregowda Maternal and congenital syphilis in Karnataka, India *Southeast Asian J Trop Med Public Health*, 45 (2) (2014), pp. 430-434 [SD-008]
12. KD Mehta, S Antala, M Mistry, Y Goswami Seropositivity of hepatitis B, hepatitis C, syphilis, and HIV in antenatal women

- in India J Infect Dev Ctries, 7 (11) (2013), pp. 832–837 [SD-008]
13. Sethi S, Das A, Kakkar N, Banga SS, Prabhakar S, Sharma M. Neurosyphilis in a tertiary care hospital in North India. Indian J Med Res. 2005;122:249–53. [PubMed]
  14. ME Patton, JR Su, R Nelson, H Weinstock, Centers for Disease Control and Prevention (CDC) Primary and secondary syphilis-United States, 2005-2013 MMWR Morb Mortal Wkly Rep, 63 (18) (2014), pp. 402–406 [SD-008]

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