

Serological Profile of Syphilis in Patients Attending the STI / RTI Clinic at Government General Hospital, Guntur, Andhra Pradesh – A Cross Sectional Study

V. Suneetha Devi Chappidi¹, Sowmya Srirama², Syam Sundar Junapudi³

¹ Department of Dermatology, Venereology & Leprosy, District Hospital, Rajahmundry, Andhra Pradesh, India.

² Department of Dermatology, Venereology & Leprosy, Siddhartha Medical College, Vijayawada, Andhra Pradesh India. ³ Department of Community Medicine, Government Medical College, Suryapet, Telangana, India.

ABSTRACT

BACKGROUND

Sexually transmitted infections (STI) are ancient and are as old as human existence. They are closely interlinked with the human sexual behaviour. Syphilis well known for its systemic complications in the pre-antibiotic era is described as the 'great imitator' by Sir William Osler, the father of modern medicine. In the present era of human immuno deficiency virus disease / acquired immuno deficiency syndrome, STI control has been made as first priority, because of their close association and interaction. Syphilis caused by *Treponema pallidum* is diagnosed most often on clinical suspicion supplemented by laboratory diagnosis, where serological tests for syphilis play a key role / main role.

METHODS

This study is a hospital based cross sectional study that consisted of 416 cases among which, 276 were females, 140 were males who had attended the STI / RTI clinic. The study period was from July 2011 to September 2012. Blood samples were drawn from all the patients (who were willing to be included in the study) attending the RTI / STI clinic, GGH, Guntur after taking consent. All the sera were tested by rapid plasma reagin (RPR) test and the sera was screened simultaneously for human immunodeficiency virus (HIV). Those sera which were tested reactive for RPR were further tested in dilutions to know the titres. Later the sera tested reactive for RPR were further tested by a specific test, *Treponema pallidum* haemagglutination (TPHA).

RESULTS

Of the total 19 (4.56 %) persons tested reactive for RPR, males were 10 (7.14 %), females were 9 (3.26 %), and these were further tested for TPHA. Of the 19 tested for TPHA, a total of 16 (84.21 %) were positive for TPHA of which males were 9 (90 %) and females were 7 (77.78 %). Among the 16 patients, positive for serological test for syphilis (STS), 13 (81.25 %) fall in the age group of 21 - 40, 2 (12.50 %) in the age group of ≤ 20, and 1 (6.25 %) is above 60 years of age.

CONCLUSIONS

In this study it was seen that out of the 16 syphilis cases, 9 were HIV reactive, 3 were non-reactive for HIV and 4 were of unknown status, showing that the rate was more among the HIV reactive group. The prevalence rate of syphilis among the 66 tested patients belonging to the high-risk group was 6.06 % and in non-high-risk group was 3.12 %, showing that it was more in people belonging to high risk group.

KEYWORDS

Serological Profile, Syphilis, *Treponema pallidum*, Sexually Transmitted Infections (STI), People Living with HIV / AIDS (PHLA)

Corresponding Author:

Dr. Syam Sundar Junapudi,
Associate Professor,
Department of Community Medicine,
GMC, Suryapet, Telangana, India.
E-mail: doctorshyamj@gmail.com

DOI: 10.18410/jebmh/2021/217

How to Cite This Article:

Chappidi VSD, Srirama S, Junapudi SS.
Serological profile of syphilis in patients
attending the STI / RTI clinic at
government general hospital, Guntur,
Andhra Pradesh - a cross sectional study.
J Evid Based Med Healthc
2021;8(17):1122-1126. DOI:
10.18410/jebmh/2021/217

Submission 28-10-2020,
Peer Review 08-11-2020,
Acceptance 09-03-2021,
Published 26-04-2021.

Copyright © 2021 V. Suneetha Devi
Chappidi et al. This is an open access
article distributed under Creative
Commons Attribution License
[Attribution 4.0 International (CC BY
4.0)]

BACKGROUND

Sexually transmitted infections are ancient and are as old as human existence and they are closely interlinked with the human sexual behaviour. Syphilis well known for its systemic complications in the pre-antibiotic era is described as 'Great Imitator' by Sir William Osler, the father of modern medicine. In the present era of human immuno deficiency virus disease / acquired immuno deficiency syndrome, STI control had made its first priority, because of their close association and interaction. Syphilis caused by *Treponema pallidum* is diagnosed most often on clinical suspicion supplemented by laboratory diagnosis, where serological tests for syphilis play a key role / main role. The serological tests for syphilis include venereal disease research laboratory (VDRL), RPR, TPHA, and fluorescent treponemal antibody absorption (FTA-ABS). But in this HIV era depending upon the immunological status of the people living with HIV / AIDS (PHLA), anti-body response to *treponema pallidum* is variable and sometimes not detectable, creating a diagnostic dilemma. The incubatory syphilis can be presumptively cured with the antibiotics used for some other illness in an individual with early syphilis. It is known as 'happen stance treatment', and it may lead to modification in the course of syphilitic illness. For example, it may present as only latent syphilis. This pattern is noted in a study conducted in India,¹ where there was significant rise in secondary and latent syphilis and decrease in primary syphilis which can be identified either by routine screening or by suspicious screening for syphilis. All the cases which attend STI / RTI clinic are to be routinely screened for syphilis, as easily treatable syphilis may co-exist with other STIs. And also, syphilis screening is to be done for antenatal cases to prevent / eliminate congenital syphilis.

Some studies on prevalence of syphilis in India and other countries show declining trends of prevalence^{2,3} and some studies show increased prevalence.^{4,5} To know whether the prevalence of syphilis is increasing or decreasing in STI patients, a study was undertaken in STI clinic of Department of Dermato-Venereology, Guntur Medical College / Government General Hospital, Guntur among those attending STI clinic with genital complaints and persons belonging to high risk groups. The purpose of the study was to study and analyse the prevalence of syphilis among the persons attending the STI / RTI clinic, department of dermatology, venereology and leprosy, Guntur Medical College / Government General Hospital, Guntur.

METHODS

The present study was hospital based cross sectional study consisting of 416 cases among which, 276 were females, 140 were males, who had attended the STI / RTI clinic. The study period was from July 2011 to September 2012 after taking Institutional ethical committee approval.

Blood samples were drawn from all the patients (who were willing to be included in the study) attending the RTI / STI clinic, GGH, Guntur after taking consent. All the sera

were tested by Rapid plasma reagin test and the sera were screened simultaneously for HIV. Those sera which were tested reactive for RPR were further tested in dilutions to know the titres. Later the sera tested reactive for RPR were further tested by a specific test, TPHA.

The patients were evaluated in detail based on history and physical examination and relevant investigations for the presence of any STD / STI. While eliciting the history of the patients, particular emphasis was made regarding the name, age, sex, marital status, address, occupation, any history of non-itchy rash on the skin, any history of solid elevated painless lesions on the genitalia, history of any swellings in the inguinal area, history of any joint pains / fever / sore throat / watering from eyes, history of jaundice / abdominal pain, history of any headache / convulsions, history of any abnormal loss of hair.

History of any STD / STI in the past, whether taken treatment for that or not, any non-itchy skin rash, history of recent vaccination, history of Hansen's disease / treatment for Hansen's disease, history of blood transfusion, history of any fever either chronic or short duration was elicited in the past history. A detailed sexual history regarding premarital / extramarital contact, last marital contact, number of sexual partners, any history of homosexuality, history of anogenital contact, last date of extra marital / pre-marital contact, whether it was protected or unprotected, if it was with a known or unknown person, whether it was under alcohol influence / not, was elicited. In females, history of abortions & still births, was noted.

A thorough clinical examination was done to start with recording the vital data, then a brief general survey was made to know the built, nourishment, anaemia, cyanosis, clubbing, generalised lymphadenopathy, rash over the body, joint / bone tenderness, pedal oedema and the status of the cardiovascular, gastrointestinal and central nervous systems.

Then a thorough local examination of the genital area was performed in all the cases in the following manner.

In males: whether the penis was circumcised or not, phimotic or non-phimotic, sub preputial sac was inspected for any ulcer, discharge, scars. The penis, scrotum, frenulum, perianal area, perineal areas were inspected for any ulcers or scars. The urethral meatus was looked for any discharge.

In females: labia majora, labia minora, fourchette, vaginal introitus, clitoris, urethral meatus, perineal & perianal area, were inspected for any ulcers or scars or any lesions.

In both sexes inguinal area was inspected for any swellings. Later palpated to note if any enlarged lymph nodes were present, number, size, shape, matted / discrete, tender / non-tender.

In females, speculum examination was done to visualise the cervix and vaginal walls for the presence of ulcers, erosions, any cervical / vaginal discharge.

Then the blood samples were collected from all the patients after taking their consent. Later the sera were tested by RPR test supplied by tulip diagnostics. The samples reactive for RPR were tested with TPHA kits. The patients were also screened for HIV as per NACO guidelines and the

following other laboratory investigations were done. Haemoglobin (Hb) %, total WBC count, differential count, erythrocyte sedimentation rate (ESR), haemogram, HBsAg, CD4 count in HIV positive cases.

Statistical Analysis

Data was analysed by using MS Office 2010.

RESULTS

During the study period from July 2011 to September 2012, of the 416 persons screened for serological tests for syphilis (STS) 140 were males, 276 were females. Of these 19 were reactive for RPR. These were further tested for TPHA, 16 were tested positive for TPHA.

Gender	No. Tested	Positivity by RPR	%	Positivity by TPHA	%
Males	140	10	7.14 %	9 / 10	90 %
Females	276	9	3.26 %	7 / 9	77.78 %
Total	416	19	4.56 %	16 / 19	84.21 %

Table 1. Over All Positivity of RPR & TPHA in Relation to Gender

Of the total 19 (4.56 %) persons tested reactive for RPR, males were 10 (7.14 %), females were 9 (3.26 %) and these were further tested for TPHA. Of the 19 tested for TPHA, a total of 16 (84.21 %) were positive for TPHA of which males were 9 (90 %) and females were 7 (77.78 %).

Age Group in Years	No. of Males (140)		No. of Females (276)		Total Positives (M + F)	%
	Total Tested	RPR + TPHA Positive	Total Tested	RPR + TPHA Positive		
≤ 20	4	1	15	1	2	12.5 %
21 – 30	45	3	166	4	7	43.75 %
31 – 40	50	4	78	2	6	37.5 %
41 – 50	27	-	13	-	-	-
51 – 60	8	-	3	-	-	-
> 60	6	1	1	-	1	6.25 %

Table 2. Analysis of RPR and TPHA Positive Cases in Relation to Age Group

No. = total no. of patients tested. Among the 16 patients, positive for STS, 13 (81.25 %) fall in the age group of 21 - 40, 2 (12.50 %) in the age group of ≤ 20, and 1 (6.25 %) is above 60 years of age.

Educational Status	Total No. of Patients Tested	No. of Cases Positive for RPR + TPHA	Percentage
Illiterates	213	9	4.23 %
Primary education	160	4	2.5 %
Secondary education	36	2	5.5 %
Graduation	8	1	12.5 %
Total	416	16	3.84 %

Table 3. Analysis of STS Positive Cases in Relation to Educational Status

In this study, out of 16 positive for RPR & TPHA, more than half i.e. 9 (56 %) patients are uneducated, of the 7 literates, 4 (25 %) patients have completed primary education (up to 5th class), 2 (12.5 %) patients have completed secondary education (6th - 12th class) and 1 (6.25 %) patient has completed graduation.

Of the 16 STS positive cases, 4 belong to the high-risk sexual behaviour, 2 male cases belong to the group of men having sex with men (MSM), 2 female cases belong to the group of commercial sex workers (CSW).

RPR & TPHA Positive Cases		High Risk Group (CSW / MSM)		Non-High-Risk Group	
No. of positives	%	No. of positives	%	No. of positives	%
16 (416)	3.84 %	4 (66)	6.06 %	12 (351)	3.12 %

Table 4. Analysis of Both RPR+TPHA Positive Cases in Relation to Sexual Behaviour

CSW = Commercial Sex Worker; MSM = Men having Sex with Men

STS Positive Cases	Primary Syphilis	%	Secondary Syphilis	%	Latent Syphilis	%
Males (9)	1	6.25	2	25	6	68.75
Females (7)	-	-	2	-	5	-
Total (16)	1	%	4	%	11	%

Table 5. Analysis of the RPR and TPHA Positive Cases According to the Stages of Syphilis

Of the total 16 syphilis cases, 1 male case was presented with primary syphilis, 4 cases were presented with cutaneous lesions of secondary syphilis. 11 cases were asymptomatic and were found to be positive syphilis on serology.

DISCUSSION

As syphilis is a disease with a wide range of manifestations and variable course starting from primary syphilis, going through secondary syphilis to latent syphilis. Very few cases of tertiary syphilis are routinely reported and any such case reported is usually associated with HIV, especially neurosyphilis. So diagnosis of syphilis in clinical settings is usually done based on both clinical findings and serological tests of the non-treponemal antibody type, like VDRL & RPR tests and a treponemal test like TPHA, FTA-ABS. Reports from several countries worldwide like Saudi Arabia,⁶ Copenhagen,⁷ Sweden,⁸ India⁹ say that no single test is absolutely diagnostic of syphilis and say that a minimum of two tests are required for the diagnosis of syphilis usually one from non-specific group and one from the specific group of tests. In this present study also, the sera of 419 patients were screened using a non-treponemal serological test RPR. And then all the sera tested reactive for RPR were further analyzed by TPHA, a specific treponemal test. The results were as follows

- RPR positivity – 19 out of 416 patients – 4.56 %
- TPHA positivity – 16 out of 19 RPR positive – 84.21 %

A retrospective study from 2005 - 2009 to know the current status of syphilis, conducted by Arpita Jain, Vibhu Mendiratta, Ram Chander in Department of Dermatology and STD, Lady Hardinge Medical College and Associated Sucheta Kriplani Hospital and Kalawati Saran Childrens Hospital, Delhi, showed a constant rate of 7 % of incidence for syphilis.¹⁰ Of the total 16 cases positive for both RPR and TPHA, 9 (6.43 %) were males and 7 (2.54 %) were females. Prevalence rate was more in males compared to females. Similar finding was noted in a study conducted in

Lady Hardinge Medical College, New Delhi.¹⁰ In the total study population of 416, 156 patients were HIV reactive of which 9 (5.77 %) were RPR & TPHA positive, 261 were non-reactive for HIV of which 7 (2.68 %) were positive for STS positive. This shows that STS positivity rate was more among the HIV infected patients.

Among the total study population of 416 patients, 296 were from urban areas, of which 11 were positive for STS. 121 were from rural areas, of which 7 were STS positive cases. This shows that positivity rate was more among the urban population in this study. A similar finding was seen in a retrospective study from 2005 - 2009 to know the current status of syphilis, conducted by Arpita Jain, Vibhu Mendiratta, Ram Chander in Department of Dermatology and STD, Lady Hardinge Medical College and Associated Sucheta Kriplani Hospital and Kalawati Saran Children's Hospital, Delhi.¹⁰

The total study population of 416 patients consisted of 49 CSWs and 17 were MSM. Of the total of 66 patients belong to the high-risk group among this 4 (6.06 %) were positive for STS and 351 belong to non-high-risk group among them 12 (3.12 %) were positive for STS, showing the positivity rate was more in high risk group.

In this present study, of the total female cases positive for STS, 3 presented with vagino-cervical discharge, 2 presented with pelvic inflammatory disease, 2 patients were people living with HIV/AIDS (PLHA), 2 presented with maculopapular rash and 2 belonging to the high-risk group (CSW) came for regular medical check-up (RMC).

In this study, of the total 9 male cases positive for STS, 1 case presented with urethral discharge and was a case of HIV / AIDS on ART. 1 case presented with squamous cell carcinoma of penis and was a case of HIV / AIDS on ART. 1 case was of PLHA on ART presented with oral candidiasis. 1 patient presented with genital ulcer (primary chancre) and urethral discharge and was found reactive for HIV on screening. 1 patient presented with herpes genitalis. 1 case came for syphilis screening. 1 case was PLHA that came for regular medical check-up. 1 patient presented with papular lesions of secondary syphilis and was found to be reactive for HIV. Another patient was PLHA presented with maculopapular rash.

In this study, of the 16 syphilis positive cases, 1 male case presented with primary chancre associated with inguinal lymphadenopathy with a positive RPR test with dilution of 1:4. secondary syphilis cases presented with maculopapular rashes in 3 cases and 1 case with papular, psoriasis form lesions and generalised lymphadenopathy and were with dilutions 1:16 to 1:32 and among those 3 were HIV reactive. And 11 cases were asymptomatic and were found to be positive for serological tests, with dilutions of 1:8 to 1:16.

CONCLUSIONS

The rate of prevalence of syphilis was found to be 3.84 % in the study population of 416 patients, attending STI / RTI clinic at GGH, Guntur, of which 16 were positive for serological tests for syphilis. Because of the 'happenstance'

treatment in the post antibiotic era, cases of syphilis were being asymptomatic clinically but serologically positive. Of the 16 syphilis positive cases 9 were males, i.e. 6.43 % and 7 were females, i.e. 2.54 %. The rate is more in the males. Of the 16 syphilis cases 13 were between the ages of 21 - 40 i.e. commonly seen in the population who were sexually active age group. Of the 16 syphilis cases, 9 were uneducated, 4 completed primary education, 2 completed secondary education, and 1 case completed graduation. This shows that syphilis positive rate was more among people with lower educational status. In this present study, of the total 16 positive cases for syphilis, 11 cases (68.75 %) were of urban population and 7 (43.75 %) were from rural population showing that the rate was more among the urban population. Analysis of the genitourinary problems among the syphilis positive cases revealed that mixed infections were commonly seen rather than isolated infections. Of the total 16 syphilis positive cases primary syphilis was only 1 case representing 6.25 % of the total syphilis cases. Secondary syphilis cases were 4 representing 25 % of the total syphilis cases. 11 cases were of latent syphilis representing 68.75 % of the total syphilis cases. In this study it was seen that out of the 16 syphilis cases 9 were HIV reactive, 3 were non-reactive for HIV and 4 were of unknown status, showing that the rate was more among the HIV reactive group. The prevalence rate of syphilis among the 66 tested patients belonging to the high-risk group was 6.06 % and in non-high-risk group was 3.12 %, showing that it was more in people belonging to high risk group.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.

Financial or other competing interests: None.

Disclosure forms provided by the authors are available with the full text of this article at jebmh.com.

REFERENCES

- [1] Ray K, Bala M, Gupta SM, et al. Changing trends in sexually transmitted infection at a Regional STD centre in North India. *Indian J Med Res* 2006;124(5):559-568.
- [2] Sethi S, Sharma K, Dhaliwal LK, et al. Declining trends in syphilis prevalence among antenatal women in India: a 10 years analysis from a tertiary health care centre. *Sex Transm Infect* 2007;83(7):592.
- [3] Temmerman M, Fonck K, Bashir F, et al. Decreasing syphilis prevalence in pregnant women in Nairobi since 1995: another success story in the STD field? *International J of STD & AIDS* 1999;10(6):405-408.
- [4] Stephenson J. Syphilis out break sparks concerns. *JAMA* 2003;289(8):974.
- [5] Desai VK, Kosambiya JK, Thakor HG, et al. Prevalence of sexually transmitted infections and performance of STI syndromes against aetiological diagnosis, in female sex workers of red light area in Surat, India. *Sexually Transmitted Infections* 2003;79(2):111-115.
- [6] Hussain A. Serological tests for syphilis in Saudi Arabia. *Genitourin Med* 1986;62(5):293-297.

- [7] Perdersen NS, Orum O, Mouritsen S. Enzymelinked immunosorbent assay for detection of antibodies to the venereal disease research laboratory (VDRL) antigen in syphilis. J Clin Microbiol 1987;25(9):1711-1716.
- [8] Lowhagen GB. Syphilis test procedures and therapeutic strategies. Semin Dermatol 1990;9(2):152-159.
- [9] Thakar YS, Chande C, Mahalley AD, et al. Seroprevalence and syphilis by TPHA test. Indian J Pathol Microbiol 1996;39(2):135-138.
- [10] Jain A, Mendiratta V, Chander R. Current status of acquired syphilis: a hospital-based 5-year study. Indian J of Sex Trans Dis & AIDS 2012;33(1):32-34.