



Original Research Article

VDRL POSITIVITY IN PATIENTS ATTENDING A TERTIARY CARE HOSPITAL GREATER NOIDA, WESTERN UTTAR PRADESH

Article History:

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Received: 11-11-2025

Revised: 25-11-2025

Accepted: 16-12-2025

Published: 31-12-2025

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INTRODUCTION

Syphilis is a sexually transmitted infection (STI) caused by the bacterium *Treponema pallidum*. It is a curable and preventable sexually transmitted infection. In India, the prevalence of STIs such as syphilis, gonorrhoea, and chlamydia has been reported to range from 0% to 3.9% [1]. It is a sexually and vertically transmitted infection caused by the spirochete *Treponema pallidum* subspecies *pallidum*. It remains one of the "great imitators" due to its diverse clinical manifestations. The

Abstract: **INTRODUCTION:** Syphilis is a chronic, systemic infectious disease caused by the bacterium *Treponema pallidum*, a delicate spiral-shaped organism that cannot survive long outside the human body. The infection is primarily transmitted through sexual contact, but it can also spread from an infected mother to her foetus during pregnancy, leading to congenital syphilis. Because of its varied clinical presentation and long course, syphilis has historically been called "the great imitator," often resembling many other medical conditions. **Aim and Objective:** To determine VDRL positivity rate in patients attending Sharda Hospital. **Materials and Methods:** A cross-sectional study was conducted over 12 months at the Department of Microbiology, Sharda Hospital. Total number of samples included in this study were 179. **Results:** Total number of samples included in this study were 179, out of which 77 samples were positive. With respect to this 7 were males and 70 were females. Maximum samples were received from Obstetrics (45.8%), Labour room (37.9%), and Paediatrics (1%), General medicine (0.6%). **Conclusion:** Syphilis continues to be a significant public health challenge despite the availability of reliable diagnostic tools and effective treatment. The findings of this study highlight the ongoing burden of infection across different patient groups and emphasize the importance of early detection through routine serological screening such as the VDRL test. Variations in positivity rates among wards reflect differences in exposure risk, awareness, and access to timely healthcare.

Keywords: Syphilis, *Treponema pallidum*, VDRL test, Serological screening, sexually transmitted infection.

epidemiological profile of syphilis varies by region, influenced by ethnographic, demographic, socio-economic, and health-related factors [2]. The clinical presentation of syphilis reflects the interaction between the pathogen, transmission behaviours, and the effectiveness of preventive and control measures. It spreads primarily through sexual contact—including oral, vaginal, and anal sex—but can also be transmitted from mother to child during pregnancy, leading to congenital syphilis [3]. The untreated infection progresses through 4 stages

(primary, secondary, latent, and tertiary) and can affect multiple organ systems, often many years or even decades after the original infection. Syphilis is a chronic disease with a waxing and waning course, which occurs worldwide and is mainly transmitted by sexual contact[4]. Its manifestations have been described for centuries and its name is a product of lengthy debates and discussions. After an incubation period of approximately 10–90 days, the disease progresses through four characteristic stages. The primary stage is marked by the development of a painless ulcer, or chancre, at the site of inoculation, accompanied by regional lymphadenopathy[5]. If untreated, the infection advances to the secondary stage, presenting with systemic manifestations such as diffuse maculopapular rashes, mucocutaneous lesions, condylomata lata, generalized lymphadenopathy, fever, malaise, alopecia, and involvement of multiple organs. This is followed by a latent stage, in which the patient is asymptomatic but remains seroreactive; latency may last for years and is classified as early or late depending on duration. In about one-third of untreated individuals, the disease eventually progresses to tertiary syphilis, a destructive stage characterized by gummatous lesions, cardiovascular involvement (notably aortitis and aneurysm), and neurosyphilis, which can present with tabes dorsalis, general paresis, cognitive decline, or sensory deficits[6]. The pathogenesis of syphilis involves both direct tissue invasion by *T. pallidum* and the host's immune response, leading to chronic inflammation and progressive tissue damage. The

Treponema genus is a spiral-shaped bacteria with a rich outer phospholipid membrane that belongs to the spirochaetal order. It is a thin, spiral-shaped, motile bacterium measuring approximately 6–20µm in length and 0.1–0.2µm in diameter, with a characteristic corkscrew morphology that enables efficient movement through mucous membranes, epithelial layers, and even dense connective tissues[7]. Unlike many bacteria, it possesses a fragile outer membrane with very low antigenic protein content, which allows it to evade immune detection and persist in host tissues for prolonged periods. Its periplasmic flagella, anchored at each end of the bacterium, provide distinctive motility that enhances its ability to penetrate host barriers. It has a slow metabolic rate, taking an average of 30 hours to multiply. The Venereal Disease Research Laboratory (VDRL) test is a widely used non-treponemal serological screening tool for the detection of syphilis.

MATERIALS AND METHODS

This cross-sectional study was conducted over a period of 12 months in the Department of Microbiology of a tertiary care hospital. Samples received from various clinical wards, including Obstetrics, Labour Room, Paediatrics, and General Medicine. The study was carried out over a defined period, during which all consecutive samples submitted for syphilis screening were processed.

RESULTS

Total number of samples included in this study were 179, Maximum samples were received from Obstetrics 82(45.8%), Labour room 68(37.9%), and Paediatrics 17 (1%), General medicine 12(0.6%).

Ward-wise distribution of samples

Table 1

WARD	No. of samples
Labour Room	68
Obstetrics	82
Paediatrics	17
General Medicine	12
Total	179

Patients of all ages from 1 day to 80 years were included and divided into different age groups.

Age wise distribution of patients positive for VDRL strip test:

Table 2:

Age Groups	No. of patients	Percentage (%)
0-20	12	15.58
21-40	30	38.96
41-60	30	38.96
61-80	5	6.49
Total	77	100.00

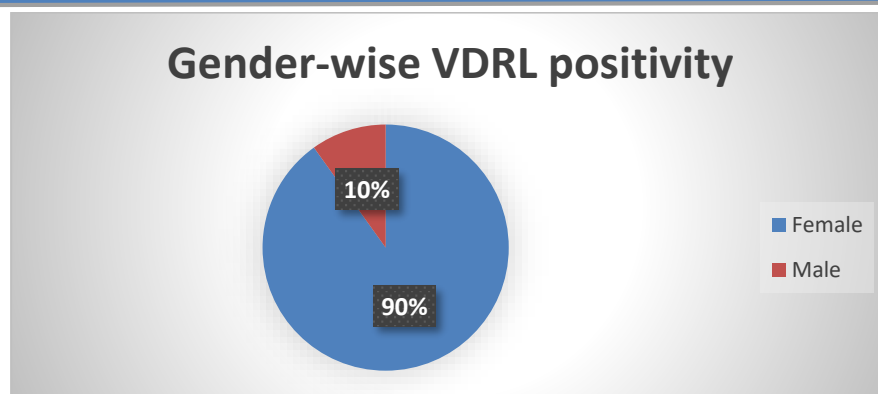


Fig. 1: Gender-wise incidence of VDRL positivity

Association Of Gender with VDRL Strip Test Positivity

Table 3

GENDER	GENRAL MEDICINE	LABOUR ROOM	Obstetrics	Paediatrics	Total
FEMALE	5	18	41	6	70
MALE	2			5	7
	7	18	41	11	77

Female positives = 70

Male positives = 7

P-value:0.025 (statistically significant, Chi square)

Out of which 77 samples were positive. With respect to this 7 were males and 70 were females.

DISCUSSION

In the present study, 179 clinically samples were studied, out of which 77 were confirmed by VDRL strip method that shows the prevalence rate of 43.1%. The present study on syphilis provides important insights into the pattern of infection within the hospital setting and highlights both consistencies and deviations when compared with findings from other hospital-based studies. It is, being a chronic and often asymptomatic sexually transmitted infection, poses significant diagnostic and public-health challenges. The hospital data observed in this study confirm that syphilis continues to affect a wide range of age groups and remains prevalent in sexually active individuals, similar to trends reported in other tertiary-care institutions across the region. The distribution of cases noted in our hospital aligns with previous research showing higher syphilis positivity among adults in the sexually active age group, reflecting the epidemiological characteristics of the disease. In terms of gender distribution, the pattern seen in our hospital parallels the findings from other hospital-based studies, where syphilis was more frequently detected among males. This may be attributed to greater healthcare-seeking behavior among men in STI clinics, higher-risk sexual practices, or underreporting of symptoms among women. However, the presence of cases among

females, particularly those detected during antenatal screening, highlights the ongoing need for routine antenatal testing to prevent congenital syphilis. Comparable hospital studies have also emphasized the critical role of antenatal surveillance programs in early detection and reduction of congenital infections. Syphilis continues to be a major public health concern despite being a curable and preventable sexually transmitted infection. The findings underscore the persistent burden of syphilis globally and in countries like India, where the prevalence of major STIs—including syphilis, gonorrhea, and chlamydia—has been documented to range from 0% to 3.9%. Such variability highlights the influence of demographic, socio-economic, and ethnographic factors on disease transmission and detection. As a “great imitator,” syphilis presents with diverse clinical manifestations that often resemble other infectious and non-infectious conditions, thereby complicating diagnosis, delaying treatment, and contributing to ongoing transmission. This complexity reinforces the need for heightened clinical awareness, particularly in resource-limited settings, where syndromic management remains common and laboratory confirmation may be lacking. Overall, the synthesis of clinical, epidemiological, and microbiological evidence presented in this study emphasizes the urgent need

for comprehensive public health strategies targeting syphilis prevention, early diagnosis, and prompt treatment. Strengthening screening programs, increasing community awareness, and improving access to diagnostic tools—especially in antenatal care—are essential steps in reducing both adult and congenital syphilis. Therefore, the diagnosis of infection is commonly performed using the VDRL and TPHA tests. This is a nonspecific test but it is useful in following treatment, since the antibody titer declines on successful therapy. It also impresses on nonvenereologists the need to cautiously order and interpret serological tests for the demonstration of syphilis. Continued research into the biology of *T. pallidum* and the host–pathogen interaction will further enhance our ability to develop more effective interventions. The persistence and resurgence of syphilis in many regions reaffirm that, despite significant advances in medicine, syphilis remains a contemporary challenge requiring sustained and coordinated efforts. The resurgence of syphilis globally highlights the need for comprehensive prevention and control strategies. Public health efforts must focus on early diagnosis, timely treatment, and strengthened surveillance systems. Education on safe sexual practices, promotion of condom use, regular screening in high-risk populations, and universal antenatal testing are crucial in reducing transmission. Integrating syphilis screening into routine healthcare services, particularly in reproductive and sexual health clinics, can further support early detection. Additionally, addressing social determinants of health—including poverty, stigma, and limited healthcare access—is essential for sustainable disease control. In conclusion, syphilis persists as a complex and challenging infection due to its diverse clinical manifestations, stealthy pathogen biology, and social and behavioral determinants. Although effective treatment exists, gaps in diagnosis, prevention, and awareness continue to fuel its spread. Strengthening public health infrastructure, promoting education, and ensuring equitable access to screening and treatment will be key to reducing the burden of syphilis and preventing its long-term complications. The study also reinforces the importance of integrating routine syphilis screening within hospital services. Similar to other hospital evaluations, our findings indicate that most syphilis cases could be identified through regular screening protocols, particularly in antenatal clinics, preoperative assessments, and STI outpatient departments. Early detection prevents progression to tertiary complications and interrupts transmission chains. Hospital-based studies consistently demonstrate that strengthening screening strategies and ensuring timely treatment with penicillin significantly reduce disease burden. Overall, the comparison with other hospital-based research indicates that syphilis remains an ongoing concern

requiring continuous surveillance, improved diagnostic capabilities, and reinforced health education within hospital settings. The findings from our hospital underscore the importance of targeted interventions, consistent screening, and robust follow-up to effectively manage syphilis. While the disease is entirely treatable, its persistence within hospital populations highlights unmet needs in awareness, prevention, and early detection. Continued monitoring and comparison with other hospitals will help identify evolving trends and enhance the effectiveness of STI control programs.

CONCLUSION

The present study demonstrates a significant prevalence of syphilis among the study population, as indicated by VDRL seropositivity. The results show a clear predominance of positive cases among males, suggesting higher exposure to risk factors and highlighting the need for targeted screening and awareness programs. The detection of VDRL positivity across different hospital departments, particularly in obstetric and labour room settings, reinforces the importance of routine syphilis screening as part of standard healthcare services. The VDRL test remains a valuable and cost-effective screening method for the early detection of syphilis, especially in resource-limited settings. However, given the possibility of false-positive results, reactive cases should be confirmed using specific treponemal tests to ensure accurate diagnosis and appropriate management. Early detection and timely treatment are essential to prevent disease progression and reduce transmission. Overall, strengthening surveillance systems, promoting safe sexual practices, and integrating routine syphilis screening into existing healthcare programs—especially antenatal services—are vital steps toward controlling the spread of syphilis and reducing its public health impact. The interpretation of VDRL results must always be performed in clinical context. A reactive VDRL test suggests the presence of syphilis infection, but due to the non-treponemal nature of the test, it may also produce false-positive results in conditions such as pregnancy, autoimmune disorders, viral infections, or chronic illnesses. Therefore, reactive cases require confirmation using treponemal tests such as TPHA, FTA-ABS, or rapid treponemal assays. However, the VDRL test remains extremely valuable for determining disease activity, because the antibody titers correlate with the burden of infection. Persistently high titers usually indicate ongoing disease, while a gradual decline after treatment is considered a marker of therapeutic success. Although the VDRL test is highly beneficial, it has limitations that must be considered by clinicians. Prozone phenomenon may produce a false-negative result in cases of very high antibody titers, and biological false positives may occur in several medical conditions. Despite these limitations, the test remains extremely

practical because of its ease of use and high sensitivity in the early stages of infection. When interpreted alongside patient history, clinical findings, and confirmatory treponemal tests, VDRL provides a reliable foundation for accurate diagnosis and effective management. In conclusion, syphilis remains a relevant health concern worldwide, but the VDRL test continues to serve as a cornerstone for its detection and control. Its ability to screen large populations, assess disease activity, and monitor treatment response makes it an indispensable tool in clinical practice. While confirmatory testing is necessary for definitive diagnosis, VDRL's strengths—low cost, simplicity, and usefulness in follow-up—ensure its continued importance. Strengthening awareness, ensuring routine screening, and integrating VDRL into public-health programs can significantly reduce the burden of syphilis and prevent its long-term complications.

DECLARATIONS

Conflicts of interest: There is no any conflict of interest associated with this study

Consent to participate: There is consent to participate.

Consent for publication: There is consent for the publication of this paper.

Authors' contributions: Author equally contributed the work.

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