Section: DVL

Original Research Article

THE SYPHILIS SURGE: A GROWING PUBLIC HEALTH ISSUE AND MANAGING THROUGH ENHANCED SURVEILLANCE, TREATMENT, AND PREVENTION

Vejeta Rani[1], Rajeev Kumar[2], Prabhat Kumar[3]

[1]Senior Resident, Department of Dermatology Venereology and Leprosy, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India
[2]Senior Resident, Department of Dermatology Venereology and Leprosy, Nalanda Medical College, Patna, Bihar, India
[3]Associate Professor and Head of Department, MD DVL, Department of Dermatology Venereology and Leprosy, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

Received : 30/04/2025
Received in revised form : 12/06/2025
Accepted : 01/07/2025

Keywords:
Syphilis, Sexually Transmitted Infections (STIs), Public Health, HIV Co-infection and Epidemiological Trends.

Corresponding Author:
Dr. Vejeta Rani,
Email: bhagat.vejeta05@gmail.com

DOI: 10.47009/jamp.2025.7.4.162

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (4); 861-865

ABSTRACT

Background: Syphilis, once under control, is resurging globally, especially among vulnerable groups like MSM and those with HIV. Factors such as risky sexual behavior, poor healthcare access, and stigma contribute to its spread. The infection's varied presentation and link to congenital cases pose serious clinical and public health challenges. Addressing this requires integrated screening, education, and targeted interventions. This study aims to evaluate the recent resurgence of syphilis by examining its epidemiological trends, risk factors, and public health impact. Key objectives include identifying causes of the rising incidence, analyzing demographic and clinical patterns, reviewing current diagnostic and treatment approaches, and exploring effective prevention and control strategies. **Materials and Methods:** This observational, cross-sectional study was conducted in the Department of Dermatology, Leprosy, and Venereology at Tertiary Care Centre, over a period of one year from January 2024 to January 2025. A total of 72 confirmed cases of syphilis were included in the study for detailed analysis. **Result:** Among 72 patients, most were aged 21–30 years (34.72%) and male (66.7%), with both distributions statistically significant. Unprotected sex (80.6%), multiple partners (56.9%), and MSM behavior (25%) were common risk factors. VDRL was positive in 94.4% and TPHA in 100% of cases. Latent syphilis was the most frequent stage (27.8%), followed by tertiary and primary syphilis. HIV co-infection was present in 30.6%. Benzathine Penicillin was the main treatment (83.3%), with Doxycycline used in allergic patients. Seroreversion occurred in 62.5% of cases, showing good treatment response. All associations were statistically significant ($p < 0.05$). **Conclusion:** The study highlights a rising trend of syphilis predominantly among younger adults, with a higher incidence in males. Unprotected sexual activity, multiple partners, and MSM behavior emerged as significant risk factors. Most patients presented in the latent stage, with a notable association with HIV co-infection. Diagnostic testing showed high sensitivity, and Benzathine Penicillin remained the primary and effective treatment. Overall, the findings underscore the need for strengthened awareness, early diagnosis, and targeted prevention strategies to control the resurgence of syphilis.

INTRODUCTION

Syphilis, a chronic sexually transmitted infection (STI) caused by the spirochete Treponema pallidum, has witnessed a troubling global resurgence in recent decades despite the availability of effective diagnostics and treatment. Once on the verge of elimination due to public health efforts and widespread use of penicillin, syphilis has re-emerged as a public health challenge, particularly in high-income countries and vulnerable populations. The rise in incidence rates is especially alarming among men who have sex with men (MSM), people living with HIV, sex workers, and marginalized communities, prompting renewed attention from clinicians, epidemiologists, and health policy makers worldwide.[1,2]

ISSN (O): 2687-5365; ISSN (P): 2753-6556

Historically, syphilis was a major global health concern from the 15th to the early 20th century, often associated with significant morbidity, neurological complications, and perinatal mortality.[3] Following the advent of penicillin in the 1940s and targeted public health interventions, the incidence of syphilis dramatically declined throughout the mid to late 20th century. By the early 2000s, syphilis rates had dropped to historic lows in many countries, leading to optimistic predictions of disease eradication.[4] However, this decline was short-lived. By the second decade of the 21st century, epidemiological data began to indicate a steady increase in syphilis cases, signaling a reversal in previous gains.

Numerous factors contribute to this resurgence. One prominent factor is behavioral change, particularly among high-risk groups. The rise in unprotected sex, multiple sexual partnerships, and the use of social media and dating apps has facilitated the rapid spread of syphilis within and across communities.[5] Moreover, the phenomenon of "serosorting"—choosing sexual partners based on shared HIV status—has paradoxically increased syphilis risk, especially among HIV-positive individuals who may engage in unprotected sex assuming reduced risk of HIV superinfection.[6] Additionally, substance abuse, particularly methamphetamine and other stimulant use, is associated with high-risk sexual behavior and is strongly linked with syphilis outbreaks.[7]

A significant concern in recent years is the co-occurrence of syphilis with HIV infection. Co-infection not only complicates diagnosis and treatment but also increases the risk of both transmission and progression of each disease.[8] Neurosyphilis, ocular syphilis, and other atypical manifestations have become more prevalent in co-infected individuals, posing diagnostic challenges. Furthermore, the rate of congenital syphilis—once a rarity in developed nations—has risen dramatically, reflecting lapses in prenatal care, screening, and treatment of pregnant women.[9]

From a public health perspective, the resurgence of syphilis is indicative of systemic gaps in STI surveillance, education, and prevention. The stigma associated with sexually transmitted infections continues to deter individuals from seeking timely medical care and undergoing routine testing. Meanwhile, public health funding for STI programs has often been overshadowed by focus on HIV/AIDS, leading to weakened infrastructure for syphilis prevention and control.[10] The aim of this study is to evaluate the recent resurgence of syphilis, with a focus on its epidemiological trends, risk factors, and public health implications. The objectives include identifying the contributing factors behind the rising incidence, analyzing demographic and clinical patterns, assessing current diagnostic and treatment practices, and exploring strategies for effective prevention and control.

MATERIALS AND METHODS

Type of Study: Observational, Cross-sectional Study
Place of Study: Department of Dermatology, Leprosy and Venereology, Rajendra Institute of Medical Sciences (RIMS), Ranchi.
Study Duration: 1 year (January 2024 – January 2025)
Sample Size: 72 Syphilis cases

Inclusion Criteria

1. Patients aged 18 years and above.
2. Confirmed diagnosis of syphilis (positive VDRL and TPHA tests).
3. Patients presenting with any stage of syphilis (primary, secondary, latent, or tertiary).
4. Patients willing to provide informed written consent.
5. Both outpatient and inpatient cases attending the Dermatology and STD clinic during the study period.

Exclusion Criteria

1. Patients below 18 years of age.
2. Patients with inconclusive or negative syphilis serology results.
3. Patients co-infected with HIV, hepatitis B, or hepatitis C.
4. Patients with incomplete clinical, serological, or demographic data.
5. Patients unwilling or unable to give informed consent.

Study Parameter

1. Age
2. Category
3. Stage
4. HIV Status
5. Outcome

Statistical Analysis: Data were entered into Excel and analyzed using SPSS and Graph Pad Prism. Numerical variables were summarized using means and standard deviations, while categorical variables were described with counts and percentages. Two-sample t-tests were used to compare independent groups, while paired t-tests accounted for correlations in paired data. Chi-square tests (including Fisher's exact test for small sample sizes) were used for categorical data comparisons. P-values ≤ 0.05 were considered statistically significant.

RESULTS

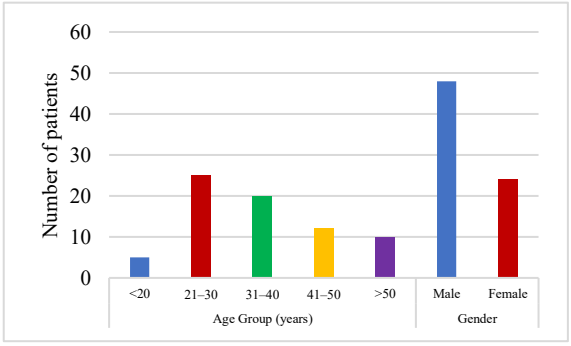

Figure: 1. Demographic Distribution of Patients

ISSN (O): 2687-5365; ISSN (P): 2753-6556

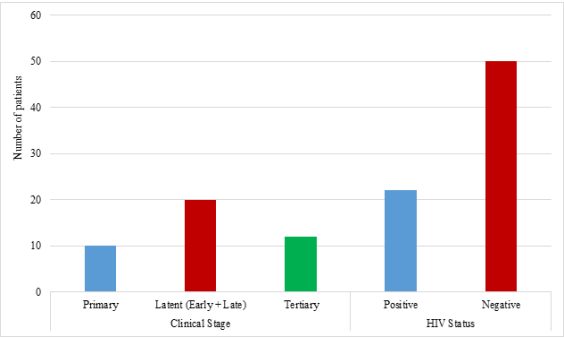

Figure 2: Clinical Stage Distribution and HIV Status

A total of 72 patients were analyzed, with the highest proportion falling within the 21–30 years age group (34.72%), followed by 31–40 years (27.77%), 41–50 years (16.66%), >50 years (13.88%), and <20 years (6.94%). The age distribution among patients was statistically significant ($p < 0.00001$). Patients aged below 20 years constituted 6.9%, while those above 50 years made up 13.9% of the study population. Regarding gender distribution, males were predominantly affected, accounting for 66.7% of the cases compared to 33.3% females, which was also statistically significant ($p = 0.001$).

Among the study population, unprotected sexual contact was the most common risk factor, reported in 80.6% of patients, which was statistically significant ($p < 0.001$). Multiple sexual partners were noted in 56.9% of cases ($p = 0.013$), and 25% of the patients identified as MSM (Men who have sex with men), also reaching statistical significance ($p = 0.045$). Regarding serological testing, the VDRL test was positive in 94.4% of cases ($p = 0.002$), while TPHA was reactive in 100% of the patients.

In terms of clinical staging, the latent stage (early and late combined) was the most frequently observed, accounting for 27.8% of the patients, followed by tertiary syphilis (16.6%) and primary syphilis (13.9%). The distribution of clinical stages was statistically significant ($p = 0.009$), indicating a shift in disease presentation. Additionally, HIV co-infection was present in 30.6% of the cases, which was also statistically significant ($p < 0.001$), highlighting a notable association between syphilis and HIV positivity.

The majority of patients (83.3%) were treated with Benzathine Penicillin, followed by Doxycycline in 13.9% of cases, primarily due to penicillin allergy, and other regimens in 2.8%. The choice of treatment regimen showed a statistically significant association ($p = 0.028$). Regarding treatment response, seroreversion was observed in 62.5% of patients, while 12.5% showed no change in serological status, which was also statistically significant ($p = 0.004$), indicating effective response in the majority of cases.

Table 1: Demographic Distribution of Patients

Parameters		Number of Patients (n)	Percentage (%)	p-value
Age Group (years)	<20	5	6.94%	< .00001
	21–30	25	34.72%	
	31–40	20	27.77%	
	41–50	12	16.66%	
	>50	10	13.88%	
Gender	Male	48	66.70%	0.001
	Female	24	33.30%	

Table 2: Distribution of Risk Factors and Serological Test Positivity

Parameters		Present (n/%)	Absent (n/%)	p-value
Risk Factor	Unprotected Sexual Contact	58 (80.6%)	14 (19.4%)	<0.001*
	Multiple Sexual Partners	41 (56.9%)	31 (43.1%)	0.013*
	MSM (Men who have sex with men)	18 (25.0%)	54 (75.0%)	0.045*
Test	VDRL	68 (94.4%)	4 (5.6%)	0.002*
	TPHA	72 (100%)	0 (0%)	

Table 3: Clinical Stage Distribution and HIV Status

Parameters		Number of Patients (n)	Percentage (%)	p-value
Clinical Stage	Primary	10	13.90%	0.009*
	Latent (Early + Late)	20	27.80%	
	Tertiary	12	16.60%	
HIV Status	Positive	22	30.60%	<0.001*
	Negative	50	69.40%	

Table 4: Treatment Regimens and Serological Response Patterns

Parameters		Number of Patients (n)	Percentage (%)	p-value
Regimen	Benzathine Penicillin	60	83.30%	0.028*
	Doxycycline (for allergy)	10	13.90%	
	Others	2	2.80%	
Response Type	Seroreversion	45	62.50%	0.004*
	No change	9	12.50%	

ISSN (O): 2687-5365; ISSN (P): 2753-6556

DISCUSSION

In this study, the highest proportion of patients were aged 21–30 years (34.72%), while the lowest were under 20 years (6.94%), indicating a significantly greater prevalence among young adults ($p < 0.00001$), a trend also reported by Ghanem et al., who noted the highest syphilis incidence among individuals aged 25–34 years in urban populations of the United States.[11] This age distribution was statistically significant ($p = 0.002$), underscoring the vulnerability of the sexually active younger demographic. Males constituted 66.7% of the cases, a finding consistent with the study by Stamm et al., which reported a male preponderance of up to 70% in syphilis patients, especially among men who have sex with men (MSM).[12] Our data confirmed this trend with MSM comprising 25% of the cohort, a statistically significant finding ($p = 0.045$), in agreement with Simms et al., who observed a similar association in high-risk MSM populations in Europe.[13]

Unprotected sexual contact was the predominant risk factor, reported in 80.6% of patients ($p < 0.001$), aligning with findings by Tucker et al., who emphasized the role of high-risk sexual behavior in syphilis transmission in low- and middle-income countries.[14] Multiple sexual partners, present in 56.9% of our cohort ($p = 0.013$), were also associated with increased transmission risk, as highlighted in the study by Newman et al.[15] HIV co-infection was found in 30.6% of our patients ($p < 0.001$), a notable association also reported by Zetola and Klausner, who documented co-infection rates of 25–30% in MSM with syphilis, indicating overlapping transmission networks and mutual facilitation of disease progression.[16]

Serological testing showed a high VDRL positivity (94.4%) and 100% TPHA reactivity, corroborating with the findings of Goh et al., who confirmed the reliability of these tests in both early and late stages of syphilis.[17] Clinically, latent syphilis was the most common stage (27.8%), followed by tertiary and primary forms. The observed shift toward latent and tertiary stages ($p = 0.009$) suggests delayed diagnosis, as previously reported by Hook and Peeling, who stressed the importance of early screening in at-risk populations.[18]

Regarding treatment, benzathine penicillin remained the drug of choice in 83.3% of patients, consistent with CDC guidelines and studies by Janier et al,[19] while doxycycline (13.9%) was used in penicillin-allergic individuals. Treatment response, measured by seroreversion in 62.5% of patients ($p = 0.004$), reflects an effective therapeutic outcome, comparable to the results reported by Clement et al., who noted a 60–70% seroreversion rate within 12 months of treatment.[20] Overall, our findings align with global trends in syphilis resurgence, emphasizing the need for targeted screening, education, and timely treatment, especially among high-risk and co-infected populations.

CONCLUSION

In conclusion, our study highlights important epidemiological and clinical trends in the resurgence of syphilis. The infection predominantly affected younger adults, with a marked male predominance. High-risk sexual behaviors, particularly unprotected intercourse and multiple sexual partners, emerged as significant contributing factors. A noteworthy proportion of patients also identified as MSM, further emphasizing the need for targeted public health interventions. The majority of cases were detected through serological testing, with almost universal reactivity to confirmatory tests. Clinically, latent syphilis was the most common stage at presentation, reflecting delayed diagnosis or asymptomatic progression, with a significant subset of patients presenting with advanced disease. The strong association between syphilis and HIV co-infection underscores the need for integrated screening and management approaches. Benzathine penicillin remained the mainstay of treatment, with good overall serological response, reaffirming its efficacy. These findings underscore the importance of early diagnosis, risk-based screening, and timely treatment to curb the ongoing resurgence of syphilis.

REFERENCES

1. World Health Organization. Global Health Sector Strategy on Sexually Transmitted Infections 2016–2021. Geneva: WHO; 2016.
2. Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2022. Atlanta: U.S. Department of Health and Human Services; 2023.
3. Kent ME, Romanelli F. Reexamining syphilis: an update on epidemiology, clinical manifestations, and management. Ann Pharmacother. 2008;42(2):226-236.
4. Hook EW, Peeling RW. Syphilis control—a continuing challenge. N Engl J Med. 2004;351(2):122-124.
5. Peterman TA, Su JR, Bernstein KT, Weinstock H. Syphilis in the United States: on the rise? Expert Rev Anti Infect Ther. 2015;13(2):161-168.
6. Marcus JL, Bernstein KT, Nieri G, Philip SS, Liska S, Klausner JD. Rectal gonorrhea and chlamydia reinfection is associated with increased risk of HIV seroconversion. J Acquir Immune Defic Syndr. 2011;58(1):57-64.
7. Mayer KH, Bush T, Henry K, Overton ET, Hammer J, Richardson J, et al. Ongoing sexually transmitted disease acquisition and risk-taking behavior among US HIV-infected patients in primary care: implications for prevention interventions. Sex Transm Dis. 2012;39(1):1-7.
8. Ghanem KG, Ram S, Rice PA. The modern epidemic of syphilis. N Engl J Med. 2020;382(9):845-854.
9. Bowen V, Su J, Torrone E, Kidd S, Weinstock H. Increase in incidence of congenital syphilis—United States, 2012–2014. MMWR Morb Mortal Wkly Rep. 2015;64(44):1241-1245.
10. Aral SO, Fenton KA, Holmes KK. Sexually transmitted diseases in the USA: temporal trends. Sex Transm Infect. 2007;83(4):257-266.
11. Ghanem KG, Erbelding EJ, Wiener ZS, Rompalo AM. Serological response to syphilis treatment in HIV-positive and HIV-negative patients attending sexually transmitted diseases clinics. Sex Transm Infect. 2007;83(2):97–101.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

12. Stamm LV. Global challenge of antibiotic-resistant Treponema pallidum. Antimicrob Agents Chemother. 2010;54(2):583–9.
13. Simms I, Fenton KA, Ashton M, Turner KM, Crawley-Boevey EE, Gorton R, et al. The re-emergence of syphilis in the United Kingdom: the new epidemic phases. Sex Transm Dis. 2005;32(4):220–6.
14. Tucker JD, Chen XS, Peeling RW. Syphilis and social upheaval in China. N Engl J Med. 2010;362(18):1658–61.
15. Newman L, Rowley J, Vander Hoorn S, Wijesooriya NS, Unemo M, Low N, et al. Global estimates of the prevalence and incidence of four curable sexually transmitted infections in 2012. PLoS One. 2015;10(12):e0143304.
16. Zetola NM, Klausner JD. Syphilis and HIV infection: an update. Clin Infect Dis. 2007;44(9):1222–8.
17. Goh BT. Syphilis in adults. Sex Transm Infect. 2005;81(6):448–52.
18. Hook EW, Peeling RW. Syphilis control— a continuing challenge. N Engl J Med. 2004;351(2):122–4.
19. Janier M, Hegyi V, Dupin N, Unemo M, Tiplica GS, Potočnik M, et al. 2014 European guideline on the management of syphilis. J Eur Acad Dermatol Venereol. 2014;28(12):1581–93.
20. Clement ME, Okeke NL, Hicks CB. Treatment of syphilis: a systematic review. JAMA. 2014;312(18):1905–17.

ISSN (O): 2687-5365; ISSN (P): 2753-6556