

# A Study On Association Of Syphilis And High Risk Behaviour In Patients Attending STI Clinic At Tertiary Care Centre

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## ABSTRACT:

**BACKGROUND:** Syphilis is one of the oldest sexually transmitted infections caused by the bacterium *Treponema pallidum* subspecies *pallidum*. The epidemiology of syphilis has exhibited fluctuations and variations throughout its history. Nevertheless, syphilis remains a substantial public health issue. The lack of robust surveillance systems for sexually transmitted illnesses presents a tough situation in India. This study aims at assessing the high-risk behaviour and HIV association among syphilis patients.

**MATERIALS AND METHODS:** A prospective, observational single centre study was carried out in the outpatient department (OPD) of the Dermatology, Venereology, and Leprosy (DVL) department at a tertiary care centre for duration of 12 months, spanning from November 2022 to November 2023. The relevant history, standard blood tests and serological examinations for syphilis and HIV were conducted.

**RESULTS:** Among 20 cases, among them 4 cases were primary syphilis, 6 secondary syphilis, 7 early latent syphilis and 2 cases of congenital syphilis. Males were predominantly (85%) affected. HIV co-infection was seen in 4 cases of secondary syphilis. Out of 20 patients, 10 were men having sex with men (MSM) and 2 showed bisexual behaviour.

**CONCLUSION:** Detection of syphilis within a limited timeframe, along with difficulties in partner treatment and contact tracing, can contribute to an escalation in the prevalence of syphilis. Moreover, it amplifies the susceptibility to contracting and disseminating HIV infection. Therefore, this study could potentially indicate increased syphilis cases among

individuals with high-risk behaviours, necessitating the rigorous enforcement of measures to control syphilis.

**KEYWORDS:** Syphilis, HIV, Homosexuals, High risk behaviour

### **INTRODUCTION:**

Syphilis is an infectious venereal disease caused by *Treponema pallidum* subspecies *pallidum*, transmitted predominantly by sexual contact. The disease got its name from a poem 'Syphilis Sive Morbus Gallicus' in which the mythical shepherd Syphilus refused to make sacrifices to Apollo and was smitten as a result [1]. Over the last three years, there has been a significant increase in the incidence of sexually transmitted diseases (STDs) in the United States, particularly among men who engage in sexual activity with other men.

Syphilis was considered on the verge of elimination in the 1960s but cases began to rise in the 1980s. From 1991 to 2005, caseload increased almost 16-fold [2]. By 2008, syphilis cases have doubled, accounting for around 38% of the total cases of STIs.

Prevalence of syphilis among patients attending specific clinics for STDs decreased from 0.5% in 2014–15 to 0.4% in 2016-17, according to statistics from the national HIV program (NACO) [3]. In 2018-19, it increased to 0.6% later dropped to 0.4% in 2019-2021 [4,5]. In 2021-2022, a slight increase to 0.45% was reported [6].

Syphilis progresses through three stages: primary, secondary, and tertiary syphilis. Each stage has been separated by a latency or syphilis incognito phase where there is an absence of any clinical evidence of syphilis [7].

Macrolide drug resistance, human immunodeficiency virus (HIV) infection and difficulty in contact tracing have played a key role in altered approach towards the disease [8]. Relentless usage of antibiotics for common ailments has led to accidental temporary remission. Co-infection with HIV has resulted in alteration in serology as well as patterns of clinical manifestations [8]. The Centre for Disease Control (CDC) devised a 'call to action' strategy to strongly urge ways and means to combat resurgence of syphilis.

### **MATERIALS AND METHODS:**

This is a prospective observational single centre study conducted in a tertiary care hospital over a period of 12 months. In our study we included all the clinically suspected or serologically positive cases of syphilis who attended to the outpatient department, Government medical college and general hospital, Anantapuram, Andhra Pradesh, India from November 2022 - October 2023. Informed consent was taken from all the patients. Seronegative patients with genital ulcers were tested again after one week. If the repeat test was non-reactive they were excluded from the study.

A detailed history was taken and data was recorded considering age, sex, duration of symptoms, high risk behaviour history, exposure, treatment, spouse status, seroreactivity and HIV reactivity. A thorough mucocutaneous examination along with systemic examination was done and findings were noted. Standard blood investigations including complete blood count, Venereal Disease Research Laboratory (VDRL) test with titres, *Treponema Pallidum* Hemagglutination Assay (TPHA) test and HIV testing were done in all cases. Confidentiality was maintained during the entire study.

Diagnosis of syphilis was based on clinical features, VDRL reactivity (with titres above 1:8) and was confirmed by TPHA. Adult patients were treated with injection Benzathine penicillin 2.4 million units given intramuscularly and congenital syphilis patients were given aqueous penicillin G after a test dose in accordance with the guidelines provided by the CDC.

#### RESULTS:

A total 20 cases presented to DVL opd in a span of 12 months which were in different phases of disease. Clinico-demographic-laboratory parameters are represented in Table 1. The maximum number of cases were encountered in 20–30 years-old age group. The age group was in range of 2 days of life-46years and 10 (50%) were below 25 years of age. Among them 10 (50%) were married and 10 (50%) were unmarried. Male predominance was seen in the present study (Table 1) with 17 male patients (85%) and 3 females (15%).10 (50%) had homosexual/ men having sex with men exposure (MSM) (40% were exclusively MSM) and two reported bisexual behaviours.

Out of these, 4 patients (20%) presented as primary syphilis (Figure 1), 6 (30%) had secondary syphilis (Figure 2,3,4,5) ,7 (35%) patients with early latent syphilis and 2 (10%) with congenital syphilis. Among them 4 (20%) secondary syphilis had HIV co-infection and were on Highly Active Antiretroviral Therapy (HAART). There was no history of blood transfusion in the past in any of the patients. Out of 3,006 patients who visited DVL opd, 20 (0.6%) were diagnosed of syphilis. Despite limited data, these results do raise some red flags and support the need for a more comprehensive investigation.

**Table 1: CLINICO-DEMOGRAPHIC-LABORATORY PARAMETERS OF PATIENTS**

SL No	Age in years/sex	Marital status	Complaints	Exposure history	VDRL reactive	TPH A	HIV screening
1.	21/M	Unmarried	Skin rash on palms & soles	Homosexual	Reactive 1:8	positive	Reactive
2	23/M	Unmarried	Screening before blood donation	Homosexual	Reactive 1:8	positive	
3	34/M	Married	Skin rash	Heterosexual	Reactive 1:8	positive	
4	25/M	Unmarried	2 Genital ulcers – 1 month (mild pain)	Homosexual	Reactive 1:16	positive	
5	22/M	Unmarried	Skin rash	Heterosexual	Reactive 1:8	positive	

<b>6</b>	45/M	Married	Genital ulcer – 3 weeks	Homosexual	Reactive 1:8	positive	
<b>7</b>	25/M	Unmarried	Skin rash on palms & soles	Homosexual	Reactive 1:16	positive	
<b>8</b>	38/M	Married	Genital ulcer – 4 weeks	Denied	Reactive 1:8	positive	
<b>9</b>	21/M	Unmarried	Extensive perianal ulcer	Homosexual	Reactive 1:8	positive	Reactive
<b>10</b>	23/F	Married	Screening in third trimester	Denied	Reactive 1:16	positive	
<b>11</b>	Day 2/F		Newborn screening		Reactive 1:16	positive	
<b>12</b>	24/M	Married	Third trimester screening	Denied	Reactive 1:16	positive	
<b>13</b>	30/M	Married	Partner screening	Heterosexual (Outside marriage)	Reactive 1:8	positive	
<b>14</b>	21/M	Unmarried	Skin rash	Homosexual	Reactive 1:8	positive	Reactive
<b>15</b>	22/M	Married	Screened during delivery	Denied	Reactive 1:32	positive	
<b>16</b>	16 days/M		Newborn screening		Reactive 1:256	positive	
<b>19</b>	29/M	Unmarried	Screening after exposure	Homosexual	Reactive 1:8	positive	
<b>18</b>	40/M	Married	Rash over penis and trunk	Homosexual	Reactive 1:16	positive	Reactive
<b>19</b>	28/F	Married	Screening After exposure	Heterosexual	Reactive 1:16	positive	
<b>20</b>	46/M	Married	Genital ulcer -20 days	Homosexual	Reactive	Positive	

**Figure 1: The chancre of primary syphilis**

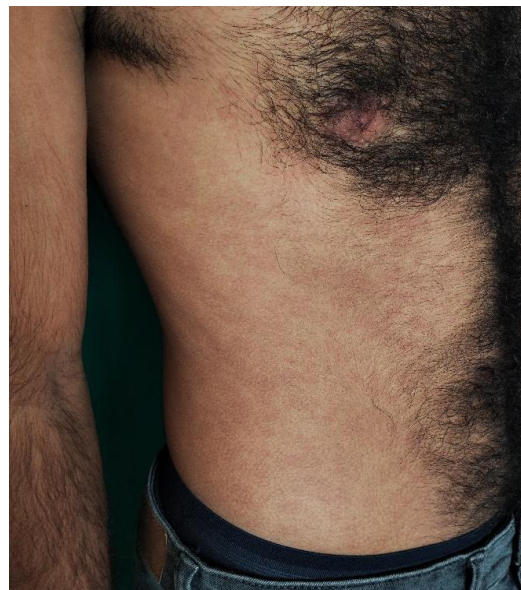


**Varied presentations of secondary syphilis**

**2: Maculopapular eruptions involving face and oral mucosa**



**3 : Generalised morbilliform rash**



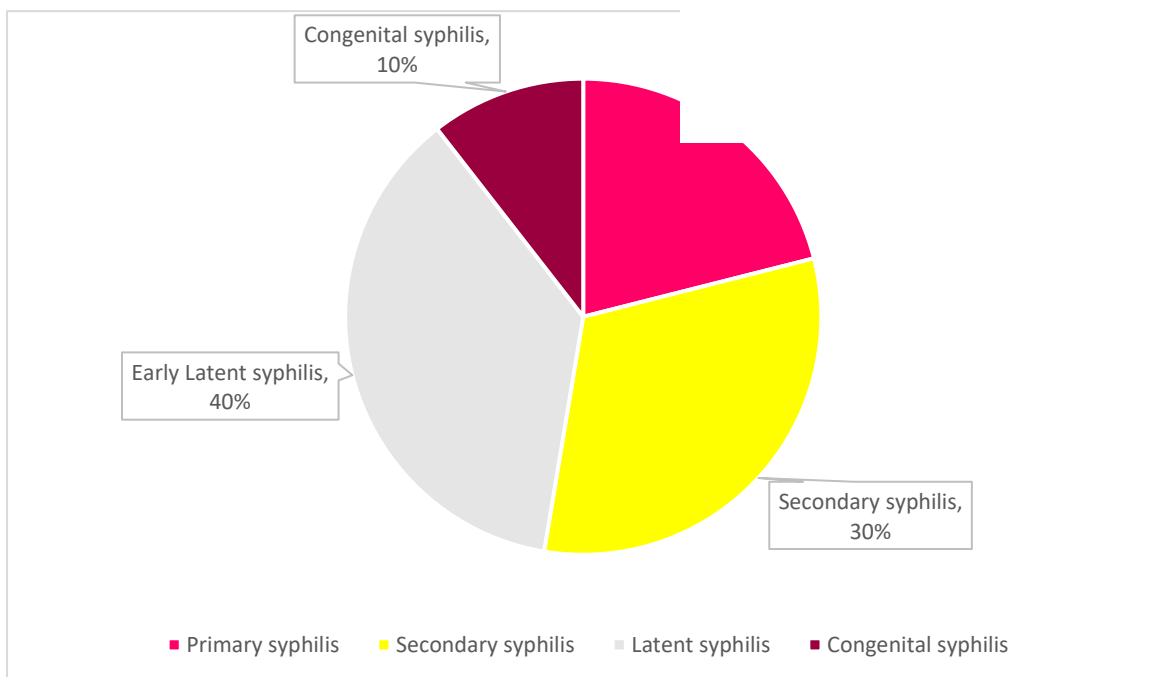
**4 : Palmar syphilides**



**5: Generalised maculopapular eruptions and nodules over scrotum**



**Figure 6: The stage of syphilis at diagnosis**



**DISCUSSION:**

A total of 20 syphilis cases were recorded in 12 months duration. Male predominance was seen in this study (85%) which was similar to studies done by Vinay Kulkarni et al [9], Rajakumari S et al [10] Swathi G et al [11] and Sundararaj S et al [12] (Table 2). The 20-30 years old age group accounted for the maximum number of cases in the current study which differs from studies by Vinay Kulkarni et al [9], Rajakumari S et al [10]. Our study showed

median age less than the other two studies. Latent syphilis (35%) is the most common stage of syphilis which is in concurrence with study by Sundararaj S et al [12] followed by secondary syphilis in 30%, is comparable to study by Rajakumari et al [10] and Vinay Kulkarni et al [9] in which secondary syphilis is the most common, seen in 66.6 and 77.7% respectively. This study showed equal number of cases among unmarried people (50%) and married which differs from studies by Vinay Kulkarni et al [9] (36%) and Swathi G et al [11] (44.4%) which reported a smaller number of cases in unmarried people. Conflicting with other studies data by Vinay Kulkarni et al [9] (25%), Rajakumari S et al [10] (25%), Swathi G et al [11] (16.6%), this study showed more number cases among MSM (40%). Congenital syphilis is an important adverse outcome of pregnancy. In this study, two cases of congenital syphilis were reported and both were asymptomatic, but the titres of newborn were more than 4 times of mother, so they were treated with aqueous penicillin G for 10 days. Our study showed lesser number of HIV reactive cases (20%) compared with the study by Sundararaj S et al (51.06%) [12].

**Table 2: Comparison with cases reported by others**

	<b>This study</b>	<b>Vinay Kulkarni et al</b>	<b>Rajakumari S et al</b>	<b>Swathi G et al</b>	<b>Sundararaj S et al</b>
<b>Median age</b>	24.5 years	42 years	28 years	30 years	
<b>Below 25 years age</b>	50%	19%	25%		
<b>Males</b>	85%	86 %	75%	55.5	78.7%
<b>Females</b>	15%	13.8%	25%	27.7	21.3%
<b>Primary syphilis</b>	20%	19.4%	33.3%	33.3%	6%
<b>Secondary syphilis</b>	30%	77.7%	66.6%	22.2%	2%
<b>Latent syphilis</b>	35%	2.7%		44.4%	91.4%
<b>Congenital syphilis</b>	10%				
<b>Married</b>	50%	58%	50%	55.5%	
<b>Unmarried</b>	50%	36%	50%	44.4%	
<b>MSM</b>	40%	25%	25%	16.6%	
<b>Bisexual behaviour</b>	10%	5.5%			
<b>HIV reactive</b>	20%				51.06%

In accordance with CDC guidelines, injection benzathine penicillin 2.4 million units was administered intramuscularly to all the adult patients. Mucocutaneous manifestations reduced after 4 weeks and the patients are currently under regular follow up for a period of two years where they are evaluated clinically and serologically for re-infection and response to treatment

Men having sex with men (MSM), female sex workers, migrants, and intravenous drug users (IDU) are the groups at highest risk for syphilis. An ecological study analysis found that the cases recorded in areas with increased syphilis among women and relatively high proportion of behaviourally bisexual MSM might have led to bridging of the syphilis epidemic from MSM to heterosexuals [13]. Migrant population poses a major public health concern related to STIs because studies suggest that migrants are more likely to engage in STI-

associated risk factors including avoidance of condom use, multiple sexual partners, and illicit drug/substance use simultaneously with sexual activities [14].

Elimination of parent to child transmission (E-PTCT) of syphilis was launched by STI/RTI control and prevention programme under National AIDS Control Organisation (NACO). The strategies include sustained commitment towards screening pregnant women for syphilis, treating seropositive pregnant women, their partners, and the newborn [15]. Prevalence of syphilis among blood donors is also increasing mainly in replacement donors, as per study by Kumar et al [16].

Many syphilis patients remain asymptomatic; hence the need to improve screening programmes among populations at the highest risk for syphilis and other treatable STIs (example - intravenous drug use). Innovative testing strategies such as creating awareness among mass via social media, opt-out testing for early diagnosis and partner tracing are needed [17]. MSM with syphilis should be educated about newer HIV prevention modalities, such as oral pre-exposure prophylaxis, as a diagnosis of syphilis is strongly associated with HIV acquisition.

## **CONCLUSION:**

Clustering of cases over a short period of time and challenges in partner treatment and tracing will increase prevalence of syphilis. It also increases the risk of acquiring and transmitting infection with HIV. An expanding high-risk group is single youth, which is gradually increasing as the age at which people get married rises. In recent years, there has been a relaxation of societal standards around same-sex relationships and premarital sex. Unmarried young individuals who engage in sexual activity are more likely to participate in risky sexual behaviours. Programmes must prioritise addressing the vulnerabilities of this demography and provide education on safe sex practices. High suspicion by physician and regular follow up of the patients is required to control the infection.

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