International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 13, No. 7, July 2024 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_13.7.2024.9

ORIGINAL RESEARCH

Clinico-Epidemiological Characteristics and Risk Factors of Secondary Syphilis in Patients Attending a Sexually Transmitted Diseases Outpatient Department: A Cross-Sectional Study

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Received: 09 May, 2024 Accepted: 28 June, 2024

ABSTRACT

Background: Secondary syphilis is a common sexually transmitted infection with diverse clinical manifestations. This study aims to determine the prevalence, age and sex distribution, and various clinical presentations of secondary syphilis in patients attending the STD outpatient department. **Methods:** This cross-sectional descriptive study was conducted from June 2021 to May 2022 at the Institute of Venereology, Rajiv Gandhi Government General Hospital, Chennai. The study included 50 patients above 18 years of age with clinical manifestations of secondary syphilis confirmed by VDRL and TPHA tests. Data on demographic characteristics, sexual practices, clinical features, and associated STIs were collected and analyzed using STATA version 14. **Result:** Most participants were aged 21-30 years (82%) and predominantly unmarried (80%). Promiscuous behavior was reported by 96%, and 90% had multiple sexual partners. The most common clinical presentations were lesions over palms and soles (48%) and hyperpigmented macules and patches (72%). Associated STIs included HIV/AIDS (8%). **Conclusion:** Secondary syphilis is prevalent among young, educated, and unmarried individuals with high-risk sexual behaviors. Targeted interventions and routine screenings are crucial for effective management and prevention.

Key words: Secondary Syphilis, Sexually Transmitted Infections, Clinical Presentation, Prevalence, Sexual Behavior, HIV Infections.

INTRODUCTION

Syphilis, a sexually transmitted infection (STI) caused by the bacterium Treponema pallidum, remains a significant public health concern globally[1]. Despite the availability of effective treatments, the disease continues to pose challenges due to its varied clinical manifestations and the stigma associated with STIs. Secondary syphilis, the second stage of this infection, is particularly noteworthy due to its diverse clinical presentations and potential for widespread systemic involvement[2]. Understanding the epidemiological and clinical characteristics of secondary syphilis is crucial for effective diagnosis, treatment, and prevention strategies.

Secondary syphilis typically occurs several weeks to a few months after the initial infection and is characterized by a wide range of symptoms, including skin rashes, mucous membrane lesions, and systemic signs such as fever and lymphadenopathy[2]. The varied nature of these symptoms often leads to misdiagnosis, which can delay appropriate treatment and increase the risk of transmission. Additionally, secondary syphilis is known for its ability to mimic

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other diseases, further complicating clinical recognition[3].

The epidemiology of secondary syphilis is influenced by multiple factors, including sexual behavior, access to healthcare, and socioeconomic status[4]. Historically, syphilis has shown cyclical trends in prevalence, with periodic increases often linked to changes in sexual behavior and public health efforts[5]. Recent years have seen a resurgence in syphilis cases in many regions, emphasizing the need for ongoing surveillance and targeted interventions.

In the context of sexually transmitted diseases (STD) outpatient departments, secondary syphilis presents both diagnostic and therapeutic challenges. These departments play a crucial role in managing STIs, providing an opportunity to study the demographics, clinical presentations, and treatment outcomes of patients with secondary syphilis. Such studies are essential for identifying trends, risk factors, and areas for improvement in clinical practice.

This study aims to provide a comprehensive clinico-epidemiological study of secondary syphilis among patients attending an STD outpatient department. The objectives of this study are twofold: first, to determine the prevalence, age, and sex distribution of patients with secondary syphilis; and second, to investigate the various clinical presentations of the disease in this population. By addressing these objectives, we hope to contribute to a better understanding of secondary syphilis and inform strategies for its effective management and control. The findings from this study are expected to provide valuable insights into the burden of secondary syphilis and its impact on affected individuals, as well as the broader community.

This study seeks to elucidate the clinico-epidemiological aspects of secondary syphilis, highlighting its prevalence, demographic distribution, and clinical manifestations in a specific patient population. Through this investigation, we aim to enhance the understanding of secondary syphilis and support efforts to improve the diagnosis, treatment, and prevention of this enduring public health issue.

MATERIALS AND METHODS

Study Design: This study was designed as a cross-sectional descriptive study, aiming to provide a snapshot of the clinico-epidemiological characteristics of secondary syphilis among patients attending the STD outpatient department.

Study Place: The research was conducted at the Institute of Venereology, Rajiv Gandhi Government General Hospital, Chennai. This institution is recognized for its specialized services in managing sexually transmitted diseases (STDs), making it an ideal setting for this study.

Study Time: The study was conducted over a one-year period, from June 2021 to May 2022. This time frame allowed for the collection of comprehensive data across different seasons, potentially capturing any seasonal variations in the prevalence and presentation of secondary syphilis.

Study Participants: The study included all male and female patients above 18 years of age who exhibited clinical manifestations of secondary syphilis, those tested positive for syphilis using the Venereal Disease Research Laboratory (VDRL) test and the Treponema pallidum hemagglutination assay (TPHA) and provided informed consent to participate in the study. The following individuals were excluded from the study: patients under 18 years of age and pregnant women, patients who did not consent to participate, and patients unwilling to comply with follow-up requirements.

Sample Size: The data was collected from 50 patients. A purposive sampling technique was employed to select participants who met the inclusion criteria during the study period. This method ensured that all eligible patients were included, facilitating a comprehensive analysis of the study population.

Study Methodology:

- **Patient Consent and Confidentiality**: Participants were thoroughly briefed on the study's purpose, procedures, and potential risks and benefits. Written informed consent was obtained from all participants, ensuring confidentiality and voluntary participation.
- **Data Collection**: Detailed clinical histories were recorded for each patient. This included demographic details, presenting complaints, marital history, detailed sexual history, past medical history, personal history, and previous treatment history.
- **General and Systemic Examination**: Each patient underwent a comprehensive general examination to check for pallor, icterus, cyanosis, clubbing, lymphadenopathy, and pedal edema. Vital signs such as pulse, blood pressure, respiratory rate, and temperature were recorded. Systemic examinations covered the cardiovascular system, respiratory system, abdomen, and central nervous system.
- **Genital and Local Examinations**: Genital examinations assessed for the presence of genital ulcers, urethral discharge, subpreputial discharge, swelling, and skin lesions. Detailed observations included the size, site, number, shape, edge, floor, and base of genital ulcers, and the characteristics of any discharges. Examinations of the scrotum, perineum, and perianal regions were conducted to identify ulcers, scars, raised lesions, and moist papules. Local lymph nodes were examined for site, size, number, consistency, and tenderness. Additionally, comprehensive skin and mucosal examinations, as well as assessments of bones and joints, were performed.
- **Bedside Investigations**: Specific bedside investigations included genital Uucer (both sexes if present), dark field microscopy for Treponema pallidum, Gram stain for gram-negative

DOI: 10.69605/ijlbpr_13.7.2024.9

coccobacillus, Tzanck smear for multinucleated giant epithelial cells, and tissue smear for Donovan bodies. Cultures using enriched gonococcus agar were performed for chancroid. In case of males: urethral discharge microscopy and culture tests, subpreputial discharge tests including 10% potassium hydroxide mount for candida and culture on Sabouraud's dextrose agar, and urine culture for gonococci. In case of females: vaginal discharge microscopy and culture tests, endocervical swab Gram stain and culture for gonococci.

- **Laboratory Investigations**: Serological tests included ELISA for HIV 1 and 2 antibodies, VDRL and TPHA for syphilis, and additional tests like ELISA for HSV-1 and 2 IgM/IgG, HbsAg, and Anti-HCV in selected high-risk cases.

Statistical Analysis: Data entry was performed using Microsoft Excel 2019. The data was double-checked for errors and missing entries. Statistical analysis was conducted using STATA version 14. Descriptive statistics were utilized to summarize the data, which were presented as frequencies and percentages. Graphical representations such as pie charts and bar diagrams were used for visual data presentation.

Ethical Issues: Ethical approval for the study was obtained from the Institutional Ethical Committee at Madras Medical College, Chennai. Participants were informed about the study's objectives, and written consent was secured from all participants. Confidentiality and anonymity of the patients were strictly maintained throughout the study.

RESULT

The study included 50 participants with the majority aged between 21-30 years. Specifically, 38% were aged 21-25 years, and 44% were aged 26-30 years. The remaining age groups had lower representation: 8% were aged 18-20 years, 4% were aged 31-35 years, 2% were aged 36-40 years, and another 4% were aged 46-50 years. Regarding educational status, 72% of the participants were graduates, 20% had completed secondary education, 6% had completed higher secondary education, and 2% were illiterate. In terms of marital status, a significant majority, 80%, were unmarried, while 20% were married. Participants were referred from various sources: 52% from dermatology departments, 20% from NGOs, 16% from private clinics, 6% through contact tracing, and another 6% from private labs (Table 1).

Table 1: Characteristics of the study participants

Variables		Frequency	Percentage
Age group in years	18-20	4	8
	21-25	19	38
	26-30	22	44
	31-35	2	4
	36-40	1	2
	41-45	0	0
	46-50	2	4
Educational status	Graduate	36	72
	Secondary	10	20
	Higher Secondary	3	6
	Illiterate	1	2
Marital status	Unmarried	40	80
	Married	10	20
Referral status	Dermatology	26	52
	NGO	10	20
	Private clinic	8	16
	Contact tracing	3	6
	Private lab	3	6

When considering promiscuity, 46% had been promiscuous for 6-10 years, 38% for 1-5 years, 6% for less than 6 months, and another 6% for 6 months to 1 year. Only 4% of participants reported no promiscuous practices. For contact status, 48% of participants reported known contacts, another 48% reported unknown contacts, and 4% denied any sexual contact. Regarding sexual orientation, 54% of participants identified as homosexual, 32% as heterosexual, and 14% as bisexual. Most participants (90%) reported having multiple sexual partners, 6% reported having a single partner, and 4% denied any sexual contact (Table 2).

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Table 2: Sexual practices among the study participants

Variable	Category	Frequency	Percentage
Promiscuity	Yes (less than 6 months)	3	6
	Yes (6 months - 1 year)	3	6
	Yes (1 - 5 years)	19	38
	Yes (6 - 10 years)	23	46
	No	2	4
Contact Status	Known	24	48
	Unknown	24	48
	Denied sexual contact	2	4
Sexual Orientation	Homosexual	27	54
	Heterosexual	16	32
	Bisexual	7	14
Number of Sexual Partners	Multiple	45	90
	Single	3	6
	Denied sexual contact	2	4

The chief complaints among the study participants were varied. Lesions over palms and soles were the most common complaint, reported by 48% of participants. Multiple dark-colored skin lesions were reported by 24%, lesions over genitalia by 14%, genital ulcers by 12%, and burning micturition by 2%. Clinical examination findings showed that 72% had hyperpigmented macules and patches, 12% had primary chancre, 10% had hyperpigmented plaques, 4% had mucous patches, and 2% had condyloma lata. Regarding other associated sexually transmitted infections, 8% of participants were people living with HIV/AIDS (PLHA), 2% had both PLHA and perianal warts, 2% had perianal warts, 2% had balanoposthitis, and 2% had verruca vulgaris. The majority, 84%, reported no associated STIs (Table 3).

Table 3: Clinical features among the study participants

Variable	Category	Frequency	Percentage
Chief Complaints	Lesions over palms and soles	24	48
	Multiple dark coloured skin lesions	12	24
	Lesions over genitalia	7	14
	Genital ulcer	6	12
	Burning micturition	1	2
Clinical Examination Findings	Hyperpigmented macules and patches	36	72
	Primary chancre	6	12
	Hyperpigmented plaques	5	10
	Mucous patch	2	4
	Condyloma lata	1	2
Associated Sexually Transmitted Infections	PLHA (People Living with HIV/AIDS)	4	8
	PLHA + Perianal wart	1	2
	Perianal wart	1	2
	Balanoposthitis	1	2
	Verruca vulgaris	1	2
	No associated STIs	42	84

DISCUSSION

This study aimed to evaluate the clinico-epidemiological features of secondary syphilis among patients attending the STD outpatient department at the Institute of Venereology, Rajiv Gandhi Government General Hospital, Chennai. Our study revealed that most participants were young adults, with 38% aged 21-25 years and 44% aged 26-30 years. These findings are consistent with previous studies that indicate a higher prevalence of secondary syphilis in young adults, likely due to more active sexual behaviors in this age group. For instance, a study by Kane et al. found similar age distributions, suggesting that targeted interventions in this demographic could be beneficial in controlling the spread of syphilis[6].

About 72% of our participants were graduates, and 20% had completed secondary education. This high level of education among patients contrasts with some previous reports that often link lower educational status to higher STI rates[7]. The higher educational level in our study may reflect a more health-conscious population seeking timely medical advice, which underscores the importance of awareness and education in STI prevention. A significant majority of our participants, 80%, were unmarried, which aligns

DOI: 10.69605/ijlbpr_13.7.2024.9

with patterns observed in other studies indicating that unmarried individuals may have higher rates of multiple sexual partners and STIs[6]. This demographic insight highlights the need for tailored health education and STI prevention programs targeting unmarried adults.

In our study, promiscuous behavior was common, with 46% reporting promiscuity for 6-10 years and 38% for 1-5 years. These findings are consistent with previous research indicating long-term promiscuity as a significant risk factor for STIs, including syphilis[8]. Only 4% reported no promiscuous practices, underscoring the pervasiveness of high-risk sexual behaviors in this population. Regarding contact status, 48% of participants reported known contacts, and another 48% reported unknown contacts. This equal distribution suggests that a significant proportion of individuals may not be aware of or may not disclose their sexual contacts, complicating contact tracing efforts. Effective contact tracing is essential for controlling syphilis outbreaks, as emphasized by the Centers for Disease Control and Prevention (CDC, 2020)[9].

The study revealed that 54% of participants identified as homosexual, 32% as heterosexual, and 14% as bisexual. This high percentage of homosexual individuals is notable and reflects similar trends seen in urban centers where men who have sex with men (MSM) represent a substantial portion of syphilis cases (CDC, 2020)[9]. Targeted interventions and education campaigns within the MSM community are crucial for reducing syphilis transmission.

The clinical presentations of secondary syphilis in our study were diverse. Lesions over the palms and soles were the most common complaint, reported by 48% of participants. This classic manifestation of secondary syphilis is well-documented in medical literature[10]. Additionally, 24% reported multiple dark-colored skin lesions, 14% lesions over genitalia, 12% genital ulcers, and 2% burning micturition. These varied presentations highlight the polymorphic nature of secondary syphilis, which can complicate diagnosis without a high index of suspicion.

Clinical examination findings showed that 72% had hyperpigmented macules and patches, 12% had primary chancre, 10% had hyperpigmented plaques, 4% had mucous patches, and 2% had condyloma lata. These results are consistent with previous studies describing the dermatological spectrum of secondary syphilis[11]. The prevalence of hyperpigmented lesions underscores the importance of thorough skin examinations in suspected syphilis cases.

Regarding co-infections, 8% of participants were living with HIV/AIDS, and small percentages had other co-infections such as perianal warts, balanoposthitis, and verruca vulgaris. Notably, 84% had no associated STIs. The co-infection rate with HIV aligns with existing literature indicating a significant overlap between syphilis and HIV, particularly among MSM[12]. These findings stress the importance of routine HIV testing in patients diagnosed with syphilis.

Our study's findings are largely consistent with the global and national trends in syphilis epidemiology. The high prevalence of secondary syphilis among young adults, particularly MSM, and the association with multiple sexual partners have been well-documented[9]. The clinical manifestations observed in our study, including lesions over palms and soles and hyperpigmented macules, are characteristic of secondary syphilis and align with previous descriptions[10].

However, the study has some limitations. The sample size of 50 participants, while adequate for a descriptive study, limits the generalizability of the findings. Additionally, the reliance on self-reported data for sexual practices and contact status may introduce reporting bias. Future studies with larger sample sizes and more rigorous data collection methods are needed to confirm and expand upon our findings.

CONCLUSION

The present study provides valuable insights into the demographic characteristics, sexual practices, clinical presentations, and associated STIs among patients with secondary syphilis. The high prevalence of secondary syphilis among young, educated, and predominantly unmarried individuals highlights the need for targeted public health interventions. By addressing these aspects, healthcare providers can improve the diagnosis, management, and prevention of secondary syphilis and its associated complications.

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