











Sexually Transmitted Infections among Human Immunodeficiency Virus Patients in a Tertiary Hospital in Surabaya, Indonesia

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ABSTRACT

Background: Human immunodeficiency virus (HIV) remains a significant global public health concern. One of its primary modes of transmission is sexual contact, leading to frequent co-infection with other sexually transmitted infections (STIs). Understanding the profile of STIs among HIV patients is essential for improving management and prevention strategies. **Purpose:** This study aims to describe the prevalence, types, and basic demographic characteristics (age and sex) of STIs among HIV patients treated at a tertiary referral hospital in Indonesia, to enhance understanding and optimize patient care. **Methods:** A retrospective observational study was conducted at Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. Researchers analyzed the medical records of HIV patients who had coexisting STIs and visited the dermatology and venereology outpatient clinic between January 2021 and December 2022. Data collected included patient demographics, STI diagnoses, and clinical characteristics. **Result:** A total of 222 HIV patients with STIs were included, with a male predominance (85.6%) and a mean age of 28.64 years. The most common STIs were anogenital warts (47.7%), latent syphilis (18.0%), unspecified syphilis (10.8%), secondary syphilis (10.4%), and molluscum contagiosum (7.7%). The findings highlight the variations in STI prevalence based on sex and age distribution among HIV patients. **Conclusion:** This study points out that there are integrated management and prevention strategies targeting both HIV and STIs. Although our study did not specifically assess sexual orientation, previous research highlights men who have sex with men (MSM) as a key high-risk population. Regular screening, early detection, and prompt treatment of STIs remain essential for improving patient outcomes and reducing transmission.

Keywords: Human immunodeficiency virus, sexually transmitted infections, anogenital warts, syphilis.

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BACKGROUND

Human Immunodeficiency Virus (HIV) remains a significant global public health issue, having caused 40.4 million deaths to date. Transmission persists in every country, and some nations that previously saw a decline in new infections are now reporting an upward

trend. By the end of 2022, approximately 39.0 million people were estimated to be living with HIV, with two-thirds of them residing in the World Health Organization (WHO) African Region.¹ According to the World Health Organization, well over 1 million curable sexually transmitted infections (STIs) are

acquired every day globally, with the majority being asymptomatic. An estimated 374 million new infections occur annually with one of four major curable STIs: chlamydia, gonorrhea, syphilis, and trichomoniasis.² The continued global burden of STIs reflects their substantial public health impact, particularly due to the risk of long-term complications when left untreated.² Moreover, the close biological and epidemiological interactions between STIs and HIV indicate the need for integrated prevention and treatment strategies to reduce transmission, improve outcomes, and mitigate comorbid risks.³

Sexually transmitted infections (STIs) significantly affect sexual and reproductive health by contributing to stigma, infertility, malignancies, and complications during pregnancy, while also elevating the risk of HIV.³ Human immunodeficiency virus (HIV) itself is primarily a sexually transmitted infection (STI). Early in the epidemic, the association between HIV and conventional STIs, those causing ulcers or mucosal inflammation, was identified and initially described as "epidemiologic synergy".⁴ In this study, we report the most prevalent STI cases among HIV patients in our center.

METHODS

This retrospective study was conducted using medical records from the Dermatology and Venereology outpatient clinic of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia. It included HIV-positive patients with STIs who came to the outpatient clinic between January 2021 and December 2022. HIV and STI diagnoses were confirmed through official medical records. Data were obtained from electronic medical records, including information on sex, age, and patient diagnosis. The sampling method used was total sampling, including all eligible HIV-positive patients with confirmed STIs during the study period. All HIV and STI patients included in this study were diagnosed and treated following national guidelines. Ethical approval was obtained from the Ethics committee of Dr. Soetomo General Academic Hospital Surabaya number 2322/112/4/VIII/2023, issued on August 8, 2023. As this study utilized anonymized retrospective data from existing medical records, the Ethics Committee waived the requirement for individual patient consent, in accordance with Indonesian regulations.

Data analysis was performed using SPSS software version 24 (SPSS Inc., Chicago, IL, USA) (SPSS, RRID: SCR_019096), with all variables analyzed descriptively. No inferential statistical tests were

conducted in this study. Continuous variables were reported using mean, maximum, and minimum values, while categorical variables were expressed as numerical values and percentages.

RESULT

The demographic characteristics of sexually transmitted infection (STI) patients in the outpatient clinic of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia (n=222), are presented in Table 1. The mean patient age was 28.64 years. The majority of patients were male, accounting for 190 cases (85.6%). From 2021 to 2022, the most common STI (Table 2) was anogenital warts, with 106 cases (47.7%), followed by latent syphilis with 40 cases (18.0%) and unspecified syphilis with 24 cases (10.8%). The term "unspecified syphilis" refers to cases with reactive syphilis serologic tests but insufficient clinical data to determine a specific disease stage. Most of these cases were found in patients who had never had syphilis symptoms and did not know when or how they were infected. This lack of clinical history made it difficult to assign a definitive stage to their syphilis diagnosis.

In sex-neutral cases, only molluscum contagiosum (7 out of 17 cases) and chancroid (2 out of 2 cases) were predominantly found in female, while the remaining infections were more common in male (Table 3). Regarding age distribution, chancroid patients had the highest mean age (47.5 years); however, this value is based on only two cases. In contrast, latent syphilis patients had the lowest mean age (23.11 years) (Table 4).

Table 1. Demographic characteristics of patients

Variable	Value
Mean age (years)	28.64
Sex	
Male, n (%)	190 (85.6)
Female, n (%)	32 (14.4)

Table 2. The 10 most common STI cases in HIV patients

No.	Disease	n(%)
1	Anogenital warts	106 (47.7)
2	Latent syphilis	40 (18.0)
3	Unspecified syphilis	24 (10.8)
4	Secondary syphilis	23 (10.4)
5	Molluscum contagiosum	17 (7.7)
6	Scabies	4 (1.8)
7	Gonococcal urethritis	3 (1.4)
8	Chancroid	2 (0.9)
9	Vulvovaginal candidiasis	2 (0.9)
10	Acute vaginitis	1 (0.5)
Total		222 (100.0)

Table 3. Sex distribution among STI cases in HIV patients

Diagnosis	Male (n)	Female (n)	Total (n)
Anogenital warts	94	12	106
Latent syphilis	38	2	40
Unspecified syphilis	23	1	24
Secondary syphilis	23	0	23
Molluscum contagiosum	7	10	17
Scabies	2	2	4
Gonococcal urethritis	3	0	3
Chancroid	0	2	2
Vulvovaginal candidiasis	0	2	2
Acute vaginitis	0	1	1
Total			222

Table 4. Age distribution among STI cases in HIV patients

Diagnosis	Mean	Minimum (years)	Maximum (years)
Anogenital warts	28.14	16	60
Latent syphilis	23.11	20	48
Unspecified syphilis	28.83	21	45
Secondary syphilis	26.65	19	58
Molluscum contagiosum	37.65	34	40
Scabies	45.50	36	54
Chancroid	47.50	45	50

DISCUSSION

We reported the ten most common STI cases in HIV patients, along with the demographic data of the included patients. A total of 222 patients visited outpatient clinic between January 2021 and December 2022, with the majority being male (85.6%) and a mean age of 28.64 years. One of the primary modes of HIV transmission is sexual contact, similar to classic STIs.⁴ Several populations are at higher risk of both HIV and STIs, including men who have sex with men (MSM) and female sex workers (FSW). Additionally, adults are more likely to contract HIV through sexual activity or intravenous drug use.⁵⁻⁸ Several factors may contribute to the higher proportion of male adults in this study. In general, males tend to initiate sexual activity at an earlier age, engage in more frequent sexual encounters, and have a higher likelihood of changing sexual partners, including interactions with FSWs.

Anogenital warts were the most common diagnosis among HIV patients in this study from 2021 to 2022, with 106 cases (47.7%). This condition also showed a strong predilection for male patients, accounting for 94 out of 106 cases. Recent studies have reported that human papillomavirus (HPV) infection is more prevalent among men MSM, particularly those who are HIV-positive. A 2022 study found that HIV-infected MSM display the highest prevalence of anal infection by high-risk HPVs and incidence of anal carcinoma. Furthermore, a 2023 study reported that the overall prevalence of HPV was 85.3% among HIV-positive MSM, putting them at a higher risk of developing HPV-associated lesions.⁹ Anogenital warts, caused by HPV infection, have an annual incidence of 100 to 200 new cases per 100,000 individuals in the general adult

population, making them one of the most common STIs.¹⁰ Human papillomavirus (HPV) is a double-stranded DNA virus with high specificity and a strong affinity for infecting cutaneous or mucocutaneous tissues, primarily targeting stratified squamous epithelial cells. In individuals infected with HIV, there is a notable depletion of key immune cells, including Langerhans cells, natural killer (NK) cells, CD4⁺ T lymphocytes, neutrophils, and macrophages. This immunosuppression significantly alters local immune responses, facilitating HPV infection and persistence at the tissue level. Studies have indicated that HIV-induced immune dysfunction impairs the body's ability to clear HPV infections, increasing the risk of persistent infection and progression to HPV-associated diseases.¹¹

This study identified a high burden of syphilis among HIV-positive patients at our center, with 39.2% of cases comprising latent, unspecified, and secondary syphilis. Notably, a considerable proportion of these were classified as “unspecified syphilis,” often due to patients presenting without a clear history of symptoms or exposure, highlighting the diagnostic challenges in routine STI screening and the need for more thorough clinical follow-up. A previous study conducted in 2017 at the same hospital reported a lower prevalence of 16.5% based on Veneral Disease Research Laboratory (VDRL) screening. This apparent increase may reflect improvements in diagnostic capacity, increased screening coverage, or a real rise in coinfection rates.¹² This trend is likely multifactorial, driven by improved detection, prolonged survival due to ART, and evolving sexual behaviors shaped by the U=U (undetectable = untransmittable) paradigm. Furthermore, a 2024 spatial mapping study conducted by Susilaningrum et al. using Surabaya Health Office data showed that early-stage and advanced syphilis together accounted for 46.49% of all STI cases in Surabaya in 2020. These findings corroborate the high burden of syphilis in the region and underscore the importance of targeted surveillance and intervention, particularly among HIV-positive populations.¹³ A 2025 study conducted in a community health center in Bandung also found that 32.1% of people living with HIV/AIDS (PLWHA) had STIs, with syphilis being the most common (72% of STI cases). Contributing factors included being MSM, referred by Non-Governmental Organizations, being in the early stage of HIV infection, and undergoing anti-retroviral therapy for 12–36 months.¹⁴ These data suggest that similar patterns may be present across various Indonesian regions. In addition, a population-based study from

North Sumatra by Salmadina and Hanifah (2024) demonstrated that low socioeconomic status, living in rural areas, and poor sexual negotiation practices were significantly associated with increased STI symptoms among Indonesian women.¹⁵ Together, these findings emphasize the importance of tailored STI-HIV interventions across Indonesia, especially among key populations and underserved communities. These national and regional patterns are consistent with global trends observed recently. Notably, the global prevalence of HIV–syphilis co-infection has significantly increased in recent years. According to a 2024 WHO report, new syphilis cases among adults aged 15–49 years increased by over 1 million in 2022, reaching 8 million, with the highest increases occurring in the Americas and African regions. A 2025 global meta-analysis reported a syphilis infection prevalence of approximately 7.5% among MSM, with several countries, including New Zealand and the United States, witnessing an increase in syphilis infections among this population. In Ontario, Canada, the co-infection prevalence showed a steady increase from 1.8 per 100 person-years in 2006 to 4.3 per 100 person-years in 2010. Similarly, in Shenzhen, China, this prevalence surged from 13.13% in 2013 to 20.9% in 2015. These trends point to the need for integrated and targeted interventions to address the rising burden of HIV and syphilis co-infections globally.^{16,17,18}

Recent studies highlight significant disparities in syphilis prevalence and distribution between low- and middle-income countries (LMICs) and high-income countries. In LMICs, syphilis remains endemic across the general population, with suboptimal testing rates among pregnant women. For instance, a study in Papua New Guinea reported that only 44.2% of pregnant women were tested for syphilis during antenatal care, and treatment coverage was below global targets. Conversely, high-income countries experience concentrated syphilis epidemics within specific populations, such as MSM, transgender women, and sex workers. A global systematic review and meta-analysis found that the pooled prevalence of syphilis among MSM was 7.5%, significantly higher than the 0.5% prevalence among men in the general population.^{19,20}

Molluscum contagiosum was also quite prevalent in HIV patients at our center, with 17 cases (7.7%), and it was the most common diagnosis with female predominance within sex-neutral cases. All age groups are susceptible to the infection, but pediatric and young adult populations are the most affected. In HIV-positive patients or those with other causes of

immunosuppression, molluscum contagiosum may present more extensively, often on the face and trunk, and tends to be more resistant to treatment.²¹ A recent review highlighted that up to 20–30% of HIV-infected individuals with advanced immunosuppression (particularly CD4 <100) may develop molluscum contagiosum, with lesions often showing chronic and recalcitrant behavior.²¹ While data specific to genital molluscum contagiosum were not stratified in this cohort, previous reports suggest that in immunocompromised adults, lesions are more often observed on the face and trunk but can involve the genital area as well.

This study highlights the significant co-occurrence of sexually transmitted infections (STIs) among HIV patients at Dr. Soetomo General Academic Hospital in Surabaya, Indonesia, between January 2021 and December 2022. The data reveal a male predominance among the HIV patients with STIs, with anogenital warts being the most common STI, followed by various forms of syphilis and molluscum contagiosum. Although data on sexual orientation were not available in this study, previous literature identifies men who have sex with men (MSM) as a key population at higher risk for STI and HIV co-infection. These findings underscore the importance of integrated management and prevention strategies for both HIV and STIs. Regular screening, early detection, and timely treatment of STIs remain essential for improving health outcomes and reducing transmission.

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