Available online at www.medicinescience.org

ORIGINAL ARTICLE

Medicine Science International Medical Journal

Medicine Science 2026;15(2):903-7

Retrospective assessment of the seroprevalence of syphilis and hepatitis in newly diagnosed HIV-infected patients

Zeynep Burcin Yilmaz, Adem Kose, Mustafa Yuksel, Yucel Duman, Funda Memisoglu, Yasar Bayindir, Mehmet Ozden, Sibel Altunisik Toplu, Yasemin Ersoy

İnönü University, Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, Malatya, Türkiye

Received 06 November 2025; Accepted 02 February 2026
Available online 29 May 2026 with doi: 10.5455/medscience.2025.11.306

Abstract

The incidence of syphilis and viral hepatitis tends to rise among individuals with Human Immunodeficiency Virus (HIV) due to similar ways of transmission. This study aimed to explore the prevalence of co-infection by investigating the seroprevalence of hepatitis and syphilis at the time of initial HIV diagnosis. We retrospectively analyzed hepatitis and syphilis tests routinely performed on patients diagnosed with HIV infection at the infectious disease's clinic of İnonu University between January 2019 and October 2021. For each participant, results of routine viral hepatitis tests [HBsAg, anti-HBs, anti-HCV, total anti-HBc, anti-HAV IgG] and syphilis tests [VDRL-RPR and TPHA] were obtained from the hospital's electronic medical record system and transferred to the Statistical Package for the Social Sciences (SPSS) software, version 22 (IBM Corp., Armonk, NY, USA) for analysis. Ninety-one patients were included, 85 (93.4%) of whom were male and 6 (6.6%) were female. The age ranged from 17 to 74, with mean value age of 36.19 ± 12.8. Syphilis serology was positive in 27 (29.7%) of the 91 patients. Examining the yearly distribution, HIV syphilis co-infection rates were 25.7% in 2019, 20.8% in 2020, and 40.6% in 2021. No anti-HCV positivity was observed. Anti-HAV IgG was positive in 84.6% of patients. HBsAg positivity was found in 5.5% of patients, while 41.8% had anti-HBs positivity. Ten patients with positive anti-HBs were also positive total anti-HBc. Notably, 20 patients acquired immunity through vaccination. Isolated total anti-HBc positivity was detected in 4.4% of patients, and their HBV-DNA values were negative. The association between HIV and co-infections remains a substantial global public health challenge. Education, vaccination, and monitoring epidemiological changes over time are vital preventive measures. It is estimated that achieving HIV-RNA suppression and confidence in powerful ART among people with HIV may reduce adherence to protective measures and pose a risk for hepatitis and syphilis transmission.

Keywords: Human immunodeficiency virus, hepatitis B, hepatitis C, syphilis, seroprevalence

Introduction

The interplay between Human Immunodeficiency Virus (HIV), viral hepatitis, and sexually transmitted infections (STIs) presents a formidable challenge to public health, particularly within populations susceptible to these infections. Annually, these infections collectively lead to approximately 2.3 million deaths globally, underscoring their detrimental impact on health systems and communities alike. Daily, over one million individuals acquire new STIs, with annual incidences of new HIV, hepatitis B (HBV), and hepatitis C (HCV) infections noted worldwide, though specific global figures can vary year to year [1]. Co-infection rates among HIV-positive individuals illustrate the significant overlap between these infections. About 1% of persons living with HBV infection (2.7 million people) are also infected with HIV. Conversely, the global prevalence of HBV infection in HIV-infected persons is 7.4% [2]. About 2.3 million people of the estimated 39 million living with HIV globally have serological evidence of past or present HCV infection [3]. Syphilis increases the risk of acquiring HIV infection by approximately two-fold, as well as of other STIs, such as gonorrhoea, chlamydia, genital herpes, among others [4]. According to HIV/AIDS surveillance in Europe 2025 surveillance report, as in previous years, most (66%) of the people diagnosed with HIV in 2024 were from the East of the Region (69292), 25% (26124) were from the West, and 10% (10506) were from the Centre. The two countries with the highest

CITATION
Yilmaz ZB, Kose A, Yuksel M, et al. Retrospective assessment of the seroprevalence of syphilis and hepatitis in newly diagnosed HIV-infected patients. Med Science. 2026;15(2):903-7.

Corresponding Author: Zeynep Burcin Yilmaz, İnönü University, Faculty of Medicine, Department of Infectious Diseases and Clinical Microbiology, Malatya, Türkiye
Email: burcin.yilmaz@inonu.edu.tr

DOI: 10.5455/medscience.2025.11.306

number of HIV diagnoses in 2024 (Poland and Türkiye) together accounted for 76% of all HIV diagnoses reported in the Centre and also had the highest percentage of HIV diagnoses with an unknown transmission mode (Poland 75% and Türkiye 72%) [5]. The advent of effective antiretroviral therapy (ART) has transformed the prognosis for those living with HIV, extending life expectancy and shifting the focus of healthcare from AIDS-related conditions to the management of other comorbidities. Nonetheless, this transition has led to a heightened prevalence of non-AIDS-related diseases, compelling healthcare professionals to address co-infection complexities [6]. The interconnectedness of HIV, hepatitis, and syphilis is evidenced by studies showing that co-infections can severely compromise the treatment effectiveness for both syphilis and HIV, adversely affecting individual health outcomes. Regional action plans have been developed with the goal of ending the epidemics of AIDS, viral hepatitis, and STIs by 2030. This effort is vital as HIV, viral hepatitis, and STIs continue to pose major public health challenges in the WHO European Region, contributing to rising mortality, especially among key populations [1,5]. Overall, it is paramount to recognize that the co-infection of HIV with syphilis and hepatitis considerably impacts disease progression and general health Given the rising incidence of co-infections among newly diagnosed HIV patients, this study aims to provide a thorough investigation of the seroprevalence of syphilis and viral hepatitis in this population. By elucidating the intricacies of these overlapping infections, the research seeks to inform targeted interventions that can enhance health outcomes for those affected by these conditions.

Material and Methods

Approval was received from the Health Sciences Non-Interventional Clinical Research Ethics Committee of İnönü University Scientific Research and Publication Ethics Board (No: 2023/4919 Date: 12 December 2023).

This retrospective study included patients aged 18 years and older who were diagnosed with HIV and followed at the Infectious Diseases Clinic of İnonu University between January 2019 and October 2021. Patients with missing serological data for hepatitis or syphilis were excluded from the analysis. For each participant, results of routine viral hepatitis tests (HBsAg, anti-HBs, anti-HCV, total anti-HBc, anti-HAV IgG) and syphilis tests (Venereal Disease Research Laboratory-Rapid Plasma Reagin (VDRL-RPR) and Treponema Pallidum Hemagglutination Assay (TPHA)) were obtained from the hospital's electronic medical record system and transferred to the Statistical Package for the Social Sciences (SPSS) software, version 22 (IBM Corp., Armonk, NY, USA) for analysis. Numerical variables were assessed for normality using the Kolmogorov–Smirnov/Shapiro–Wilk test and were presented as mean ± standard deviation for normally distributed data or median (minimum–maximum) for non-normally distributed data. Categorical variables were expressed as numbers and percentages.

Results

The study included 91 patients, consisting of 85 males (93.4%) and 6 females (6.6%). Participants ranged in age from 17 to 74 years, with a mean value age of 36.19 ± 12.8. Syphilis screening was performed in all HIV positive patients using both a non treponemal test (VDRL/RPR) and a treponemal test (TPHA). For the purposes of this study, patients were considered to have serological evidence of syphilis infection if they had a reactive TPHA test in combination with a reactive VDRL/RPR test. In cases with discordant results (reactive VDRL/RPR and non reactive TPHA, or vice versa), no additional confirmatory tests (e.g. Fluorescent Treponemal Antibody Absorption (FTA-ABS), Treponema Pallidum Particle Agglutination (TPPA), or Western blot) were performed beyond VDRL/RPR and TPHA. Overall, 27 of 91 patients (29.7%) met the serological criteria for syphilis infection. Yearly analysis showed HIV-syphilis co-infection rates of 9/35 (25.7%) in 2019, 5/24 (20.8%) in 2020, and 13/32 (40.6%) in 2021. All patients with co-infection were documented to have received appropriate treatment. Due to the retrospective design and incomplete documentation of clinical manifestations and timing of symptom onset, syphilis cases could not be reliably classified as primary, secondary, or latent. One male patient was found to have a triple infection of HBV, HIV, and syphilis. No anti-HCV positivity was observed. Anti-HAV IgG was positive in 77 patients (84.6%). The mean value age of patients who are not immune to hepatitis A was 37.8 ± 14.25. HBsAg was detected in five patients (5.5%), while 38 patients (41.8%) tested positive for anti-HBs. Ten patients who were anti-HBs positive also had a positive total anti-HBc result. Twenty patients with positive anti-HBs and negative anti-HBc total were identified as having vaccine-induced immunity. Four patients (4.4%) showed isolated anti-HBc total positivity, and all four had negative HBV-DNA results. The mean value age of patients who are not immune to hepatitis B was 36.29 ± 10.61. Vaccination was administered to 44 patients with negative HBV serology and all 14 patients susceptible to hepatitis A.

Discussion

Screening for co-infections such as HAV, HBV, HCV, and syphilis early in HIV-positive individuals is critical for preventing negative health effects and applying protective measures in disease management. In this study, the seroprevalence of syphilis among newly diagnosed people living with HIV (PLWH) was 29.7%. This rate is close to the upper range of reported syphilis prevalences (approximately 7–35%) among PLWH in Türkiye and is consistent with the increasing burden of co-infection reported in recent years [7,8]. Compared with other single-center and multicenter cohorts from Türkiye that have reported syphilis co-infection rates between about 7.6% and 35.3%, the findings of this study support that syphilis is a frequent co-infection in PLWH and that routine syphilis screening should be an integral part of HIV care. National and international data indicate that syphilis co-infection in PLWH is particularly concentrated in younger and

DOI: 10.5455/medscience.2025.11.306

male patients, underlining the importance of regular serological follow-up in these groups [7-10]. If the decline in patient numbers due to the pandemic is disregarded, our observations point to a notable rise in the link between HIV and syphilis. Higher syphilis prevalence in HIV-infected individuals may lead to increased HIV transmission and a greater potential for complications [11-13]. Additionally, HIV-negative patients with syphilis need to be fully aware that this infection can facilitate HIV co-infection. Syphilis increases susceptibility through mucosal disruption and changes in the genital tract microenvironment [14]. Syphilis-HIV co-infection has been correlated with higher virological failure and an inadequate serological response to standard treatments [15]. Conversely, HIV can modify syphilis symptoms and obscure the differentiation between disease stages [14]. Also, syphilis treatment failure is more frequent in HIV-positive individuals with syphilis co-infection compared to HIV-negative groups [16]. Despite effective treatment for syphilis, its clinical and socioeconomic impact remains. Inadequate testing and treatment coverage contribute to negative outcomes [17]. The burden of syphilis co-infection remains high, and diagnosis can be complex [18]. Co-infection may result in more severe neurocognitive impairment [11]. Another study reported rapid progression to neurosyphilis and gummatous syphilitic hepatitis in a patient newly diagnosed with HIV [19]. This case demonstrates the potential for serious manifestations of syphilis and hepatitis in the setting of HIV infection.

Viral hepatitis co-infection in HIV-positive cases has major implications for disease progression, treatment results, and overall illness and death rates. Co-infection with HBV and/or HCV can lead to increased immune suppression, liver toxicity, and accelerated liver fibrosis progression [20]. Co-infection hastens the advancement of chronic HBV to cirrhosis, end-stage liver disease, or hepatocellular carcinoma compared to chronic HBV infection alone [21]. Research indicates that HIV-HBV co-infection is associated with increased all-cause and liver-related mortality. HCV co-infection, on the other hand, is significantly linked to increased all-cause and liver-related mortality but not with increased AIDS-related mortality [22]. The prevalence of HIV-HBV co-infection in our patients was 5.5%, consistent with existing literature. However, the high rate of individuals susceptible to HBV infection (48.4%) was striking. Seroprevalence studies underscore the need for better vaccination campaigns against HAV and HBV, alongside the importance of early diagnosis and proper management of co-infections, and the requirement for effective prevention and control measures for all infections. Jansen et al. found high prevalence and incidence of HBV, HCV, and syphilis co-infection in HIV-positive MSM in Germany. The incidences for HBV, HCV, and syphilis were reported as 2.51, 1.54, and 4.06 per 100 person-years, respectively. The study also revealed that fewer than 50% of screened participants had effective HBV vaccination [23]. This finding, similar to our study, emphasizes the need to improve vaccination efforts.

The introduction of highly effective treatments for HCV has transformed the management of this infection, offering the possibility of eliminating chronic hepatitis C in HIV-coinfected individuals in resource-rich environments [24]. The absence of hepatitis C positivity in our patients is a significant finding in the context of global HCV elimination efforts, and is consistent with the WHO's 2022–2030 Global Health Sector Strategy target of a 90% reduction in new HCV infections by 2030.. However, challenges remain, especially in resource-limited settings where access to these treatments may be restricted. Furthermore, studies have reported lower response rates to direct-acting antiviral therapy in HCV/HIV co-infection, particularly in people with liver cirrhosis. Liver cirrhosis has been recognized as a risk factor for treatment failure in HCV/HIV co-infections [25]. Early initiation of ART in HIV-infected patients, with or without hepatitis co-infections, can reduce the progression of liver fibrosis [26]. Therefore, identifying HIV-viral hepatitis co-infection is crucial for optimizing treatment plans, monitoring drug interactions, and preventing further liver damage. The Centers for Disease Control and Prevention and the U.S. Preventive Services Task Force recommend at least one HIV test for all people aged 15-65. Those at higher risk for HIV infection, such as sexually active gay, bisexual, and other MSM, should be screened for HIV at least once a year. It is also recommended that HIV-infected individuals be screened for sexually transmitted diseases at least annually, with more frequent screening for high-risk individuals.

Limitations of Our Study

Since data were obtained from records, systematic information on transmission routes, sexual behavior, substance use, or previous history of sexually transmitted infections is not available; however, these are key determinants of comorbidity. Fear of stigma prevents us from gathering information from patients regarding transmission modes. Patients concealing their sexual preferences obstruct a complete overview and the formation of a comprehensive strategy.

The study population consisted predominantly of male and relatively young individuals; therefore, the findings may not reflect women living with HIV and older adults.

Due to incomplete documentation, syphilis staging (primary/secondary/latent) could not be reliably determined; this prevents the analysis of stage-specific patterns and outcomes.

Conclusion

In conclusion, this study demonstrates that syphilis and hepatitis co-infections are highly prevalent among newly diagnosed PLWH, with a syphilis co-infection rate of 29.7% and a notable proportion of individuals susceptible to HBV infection. The rising trend in HIV-syphilis co-infection rates observed between 2019 and 2021 underscores the ongoing public health burden of these overlapping infections. It is clear that co-infection with syphilis and hepatitis is common

in people newly diagnosed with HIV and has a significant impact on treatment and outcomes. Therefore, comprehensive screening, diagnosis, and treatment for syphilis and hepatitis are essential parts of care for newly diagnosed HIV patients. Our cohort showed no HCV co-infection and a high rate of HAV immunity; however, the significant proportion of individuals susceptible to HBV underscores the urgent need for targeted vaccination programs.omprehensive and routine screening for syphilis and viral hepatitis at the time of HIV diagnosis is essential for early detection, prompt treatment, and prevention of disease progression. Vaccination against HAV and HBV should be systematically offered to all seronegative HIV-positive patients. It is also critical to emphasize that viral suppression achieved through effective ART does not eliminate the risk of acquiring or transmitting syphilis or hepatitis, and behavioral risk reduction counseling must remain an integral component of HIV care. Multidisciplinary approaches combining education, vaccination, regular serological follow-up, and epidemiological surveillance are key to achieving the 2030 targets for ending the epidemics of AIDS, viral hepatitis, and STIs.

Ethical Approval

Approved by the Health Sciences Non-Interventional Clinical Research Ethics Committee of İnönü University Scientific Research and Publication Ethics Board (No: 2023/4919 Date: 12 December 2023).

Patient Consent

Informed consent was waived due to the retrospective design.

Conflict of Interest

The authors declare no conflict of interest.

Funding

The authors received no financial support for this study.

References

1. https://www.who.int/europe/publications/m/item/regional-action-plans-2022-2030-for-ending-aids-and-the-epidemics-of-viral-hepatitis-and-sexually-transmitted-infections.-information-sheet access date 12.01.2026
2. Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. https://www.who.int/news-room/fact-sheets/detail/hepatitis-b access date 12.01.2026
3. Hepatitis C is an inflammation of the liver caused by the hepatitis C virus. https://www.who.int/news-room/fact-sheets/detail/hepatitis-c access date 12.01.2026
4. Most infections are asymptomatic or unrecognized. https://www.who.int/news-room/fact-sheets/detail/syphilis access date 12.01.2026
5. This report presents HIV/AIDS surveillance data for 2024, which shows significant variation in epidemic patterns and trends across the World Health Organization (WHO) European Region. https://www.who.int/europe/publications/i/item/9789289062671 access date 12.01.2026
6. Chen G, Ya C, Yao Y, et al. Syphilis incidence among men who have sex with men in China: results from a meta-analysis. Int J STD AIDS. 2016;28:170-8.
7. Merdan S, Merdan Y, Aydoğan O, et al. Burden of syphilis among people living with HIV: a large cross-sectional study from Türkiye. Eur J Clin Microbiol Infect Dis. 2025;44:2231-7.
8. Sarikaya B, Oksüz E. Investigation of Seroprevalence of Viral Hepatitis and Syphilis Co-infection in Individuals Living with HIV: A Single-Center Experience. Haydarpasa Numune Med J. 2025;65:63-7.
9. Kömür S, Ertürk D, Sevdimbaş S, et al. Evaluation of HIV and Syphilis Co-infected Cases, Data from a University Hospital. Curr HIV Res. 2024;22:153-7.
10. Zhang C, Ren Q, Chang W. Epidemiological Features and Risk Factors for Acquiring Hepatitis B, Hepatitis C, and Syphilis in HIV-Infected Patients in Shaanxi Province, Northwest China. Int J Environ Res Public Health. 2020;17:1990.
11. Fan L, Yu A, Zhang D, et al. Consequences of HIV/Syphilis Co-Infection on HIV Viral Load and Immune Response to Antiretroviral Therapy. Infect Drug Resist. 2021;14:2851-62.
12. Solomon H, Moraes AN, Williams DB, et al. Prevalence and correlates of active syphilis and HIV co-Infection among sexually active persons aged 15-59 years in Zambia: Results from the Zambia Population-based HIV Impact Assessment (ZAMPHIA) 2016. PLoS One. 2020;15:e0236501.
13. Wu Y, Zhu W, Sun C, et al. Prevalence of syphilis among people living with HIV and its implication for enhanced coinfection monitoring and management in China: A meta-analysis. Front Public Health. 2022;10:1002342.
14. Barba A, Bati F, Tura JB, et al. Magnitude and Determinants of Syphilis and HIV Co-Infection Among Female Sex Workers in Ethiopia: Evidence from Respondent Driven Samples, 2019-2020. HIV AIDS (Auckl). 2022;14:473-85.
15. Chan P, Tang THC, Kwong RTS, et al. Effects of syphilis infection among HIV-1-positive individuals on suppressive antiretroviral therapy. AIDS Res Ther. 2022;19:69.
16. Rodriguez PJ, Roberts DA, Meisner J, et al. Cost-effectiveness of dual maternal HIV and syphilis testing strategies in high and low HIV prevalence countries: a modelling study. Lancet Glob Health. 2021;9:e61-e71.
17. Gilbert L, Dear N, Esber A, et al. Prevalence and risk factors associated with HIV and syphilis co-infection in the African Cohort Study: a cross-sectional study. BMC Infect Dis. 2021;21:1123.
18. Boateng R, Mutocheluh M, Dompreh A, et al. Sero-prevalence of Hepatitis B and C viral co-infections among HIV-1 infected ART-naïve individuals in Kumasi, Ghana. PLoS One. 2019;14:e0215377.
19. Pilozzi-Edmonds L, Kong LY, Szabo J, et al. Rapid progression to gummatous syphilitic hepatitis and neurosyphilis in a patient with newly-diagnosed HIV. Int J STD AIDS. 2015;26:985-7.
20. Cheng Z, Lin P, Cheng N. HBV/HIV Coinfection: Impact on the Development and Clinical Treatment of Liver Diseases. Front Med (Lausanne). 2021;8:713981.
21. Thornton AC, Jose S, Bhagani S, et al. Hepatitis B, hepatitis C, and mortality among HIV-positive individuals. AIDS. 2017;31:2525-32.
22. Jansen K, Thamm M, Bock CT, et al. High Prevalence and High Incidence of Coinfection with Hepatitis B, Hepatitis C, and Syphilis and Low Rate of Effective Vaccination against Hepatitis B in HIV-Positive Men Who Have Sex with Men with Known Date of HIV Seroconversion in Germany. PLoS One. 2015;10:e0142515.
23. Marquez LK, Ingiliz P, Boesecke C, et al. Establishing a framework towards monitoring HCV microelimination among men who have sex with men living with HIV in Germany: A modeling analysis. PLoS One. 2022;17:e0267853.
24. Boesecke C, Ingiliz P, Berger F, et al. Liver Cirrhosis as a Risk Factor for Direct-Acting Antiviral Therapy Failure in Real-Life Hepatitis C Virus/Human Immunodeficiency Virus Coinfection. Open Forum Infect Dis. 2017;4:ofx158.

DOI: 10.5455/medscience.2025.11.306

25. Ding Y, Duan S, Ye R, et al. More improvement than progression of liver fibrosis following antiretroviral therapy in a longitudinal cohort of HIV-infected patients with or without HBV and HCV co-infections. J Viral Hepat. 2017;24:412-20.

26. He L, Pan X, Yang J, et al. Current syphilis infection in virally suppressed people living with HIV: a cross-sectional study in eastern China. Front Public Health. 2024;12:1366795.