

## Artigo

# Syphilis in people living with HIV followed up in a referral hospital in Brazil between 2015 and 2020

## *Sífilis em pessoas vivendo com HIV acompanhadas em hospital de referência no Brasil entre 2015 e 2020*

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**ABSTRACT: Introduction:** Co-infection by syphilis and HIV/AIDS is widely diagnosed in Brazil, since the lesions of primary syphilis amplify the chances of HIV/AIDS dissemination, in addition to sharing risk factors between the diseases. The clinical, laboratorial, and epidemiological variables of co-infection can modify over time and should be periodically evaluated. **Objective:** To describe the clinical, laboratorial, and epidemiological characteristics of patients with syphilis and HIV/AIDS co-infection in a hospital in Recife, in the period between 2015 and 2020. **Material and Methods:** This was a cross-sectional, retrospective study, carried out using a questionnaire produced by the researchers themselves, associating the clinical, epidemiological, laboratorial, and therapeutic variables related to syphilis in people living with HIV/AIDS. **Results:** 171 patients were included, mean age  $34.2 \pm 11$  years, 99 of them were male. There was a predominance of mixed colored skin or black men ( $p: 0.017$ ), single or not in a stable union ( $p<0.001$ ), bisexual or homosexual ( $p<0.001$ ), who do not use illicit drugs ( $p: 0.026$ ), and who has anal sex ( $p<0.001$ ) and, among women, a predominance of non-employed women ( $p<0.001$ ), and with income below the poverty line ( $p: 0.032$ ). The most frequently diagnosed clinical stage of syphilis in HIV/AIDS patients was latent syphilis. **Conclusion:** There was a predominance of patients with specific sociodemographic characteristics, showing a profile of vulnerability in homosexual and bisexual men, and mixed colored skin, who do not use illicit drugs, and who has anal sex. Among the women, there was a predominance of non-employed women and with income below the poverty line. The clinical stage of syphilis most frequently diagnosed was latent syphilis.

**KEYWORDS:** Syphilis; Co-infection; HIV; Acquired Immunodeficiency Syndrome.

**RESUMO: Introdução:** A coinfeção por sífilis e HIV/AIDS é amplamente diagnosticada no Brasil pois, além do compartilhamento dos fatores de risco entre as doenças, as lesões da sífilis primária amplificam as chances de disseminação do HIV/AIDS. As variáveis clínicas, laboratoriais e epidemiológicas da coinfeção podem modificar-se ao longo do tempo e devem ser periodicamente reavaliadas. **Objetivo:** Descrever as características clínicas, laboratoriais e epidemiológicas de pacientes com coinfeção de sífilis e HIV/AIDS em um hospital no Recife, no período entre 2015 e 2020. **Material e Métodos:** Este foi um estudo transversal, retrospectivo, realizado por meio de questionário produzido pelos próprios pesquisadores, associando as variáveis clínicas, epidemiológicas, laboratoriais e terapêuticas relacionadas a sífilis em pessoas vivendo com HIV/AIDS. **Resultados:** Foram incluídos 171 pacientes com idade média de  $34,2 \pm 11$  anos, sendo 57,9% (99) do sexo masculino. Houve predomínio de homens pardos ou negros ( $p=0,017$ ), solteiros, ou sem união estável ( $p<0,001$ ), bissexuais ou homossexuais ( $p<0,001$ ), que não realizam o uso de drogas ilícitas ( $p=0,026$ ) e que realizam sexo anal ( $p<0,001$ ). Entre as mulheres, predomínio de mulheres não empregadas ( $p<0,001$ ) com renda inferior à linha de pobreza ( $p=0,032$ ). O estágio clínico da sífilis em pacientes com HIV/AIDS mais frequentemente diagnosticados foi a sífilis latente. **Conclusão:** Houve predomínio de pacientes com características sociodemográficas específicas, demonstrando um perfil de vulnerabilidade em homens homossexuais e bissexuais, e pardos, que não realizam uso de drogas ilícitas, e que realizam sexo anal. Entre as mulheres, houve predomínio de não empregadas e que vivem com uma renda inferior à linha da pobreza. O estágio clínico da sífilis mais frequentemente diagnosticado foi a sífilis latente.

**PALAVRAS-CHAVE:** Sífilis; Coinfeção; HIV; Síndrome de Imunodeficiência Adquirida.

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## INTRODUCTION

The World Health Organization (WHO) estimates that about 5.6 million new cases of syphilis are diagnosed each year among adolescents and adults aged 15 to 49 years old. In addition, syphilis was the cause of death of more than 300,000 fetuses and neonates worldwide in 2018. Therefore, despite global efforts to eliminate syphilis, it remains endemic in developing countries and is emerging among men who have sex with men (MSM) and transgenders in developed countries, especially China, the U.S., and Western Europe<sup>1-3</sup>.

In Brazil, the compulsory notification of acquired syphilis was established only on August 21, 2010 through an Ordinance no.2472 of the Ministry of Health, although the compulsory notification of congenital and gestational syphilis precedes from this date, therefore, epidemiological data related to acquired syphilis prior to this date are scarce. Through the *Boletim Epidemiológico da Secretaria de Vigilância em Saúde do Ministério da Saúde* (Epidemiological Bulletin of the Health Surveillance Secretary of the Ministry of Health), an increase in the detection rate of acquired syphilis from 2015 to 2021 was verified, from 34.1/100,000 inhabitants, to 78.5/100,000 inhabitants, respectively. In this same period, there was a sharp change in the M:F ratio in patients: in 2010, this index was 0.2, in other words, for every 2 men diagnosed with syphilis, there were 10 women with syphilis. In 2021, the index became 1.7, in other words, for every 17 men with syphilis, 10 women had syphilis<sup>4</sup>.

In the State of São Paulo stands out for having a syphilis incidence 1.11 times higher than the National average with an increasing rate in syphilis cases from 2011 to 2017, with an 86.3% increase during this period. The State had the ninth worst rate in Brazil in 2021. An increase in the detection rate is observed in the city of São Paulo, with a rate of almost 150 new cases per 100,000, compared to the State of São Paulo, with an incidence of 87.5 per 100,000.<sup>(4)</sup> In the State of Rio de Janeiro, a cross-sectional study aligned to a cohort, conducted at the *Instituto Nacional de Doenças Infecciosas* (National Institute of Infectious Diseases), with 292 participants between 2010 and 2012 indicated the prevalence of 9.9% of syphilis among MSM, as well as the fact that 20% had at least one sexually transmitted infection (STI)<sup>5</sup>.

Data in Pernambuco indicate that the epidemic is concentrated in adults aged 20 to 39 years old, with a predominance of mixed colored ethnicity, mostly female. The schooling of patients with syphilis in Pernambuco cannot be precise, since compulsory notification fails in 49.17% of the cases, with omission higher than the National average. Among the reported cases, most of them have incomplete primary schooling. The cities that had a detection rate higher than the State average were: *Igarassu*, *Vitória de Santo Antão*, *Olinda*, *Jaboatão dos Guararapes*,

*Recife*, *São Lourenço da Mata*, and *Camaragibe*<sup>6</sup>.

Even with a continuing decline in HIV-related mortality, more than 36 million people were still with HIV/AIDS in 2021, and the virus remains an annual cause of death for more than 1 million people worldwide. On a global scale, deaths of HIV or related causes peaked in 2006, when they gradually began to fall as a result of increased coverage of antiretroviral therapy (ART), which increased and approximately sevenfold from 2006 to 2017<sup>7</sup>. In Latin America, there has been a 5% increase in prevalence from 2000 to 2021, with about 2.2 million people with HIV in 2021. Of these, 82% knew of their diagnosis and 69% were in treatment<sup>8</sup>.

Epidemiological studies were carried out in the State of São Paulo, with patients at a Sexually Transmitted Infection (STI) Outpatient Clinic and Counseling and Testing Center (CTC) aimed to collect information on the co-infection between syphilis and HIV. Among the 361 patients infected with syphilis, 82 presented positive serology for HIV/Aids, which represents a co-infection of 22.7% in patients of this sample. Other results found in this study demonstrated males and MSM were increased risk factors for co-infection<sup>9</sup>. Syphilis co-infection in people with HIV has also been described in other Brazilian States. A cross-sectional study conducted at the CTC and STI outpatient clinic in Pará, with people with HIV assisted between 1998 and 2018, described syphilis co-infection in 14.1% of the patients<sup>10</sup>. In Goiás, a cross-sectional study conducted in 2018, also people with HIV, described a prevalence of syphilis co-infection of 76.8%<sup>11</sup>.

The clinical manifestations of syphilis in patients with HIV infection are still not well understood by the literature. However, cases of patients unaware of the diagnosis of HIV infection with bilateral cervical and axillary lymphadenopathy have been reported. The patients complained of fatigue and progressive weight loss, and the physical examination showed ulcerated erythematous papules with crusted edges on the face, scalp, and neck, consistent with a diagnosis of malignant syphilis, a rare condition affecting mainly immunocompromised patients, first described in 1972 as a severe manifestation of secondary syphilis<sup>12,13</sup>.

Thus, the aim of this study was to describe the clinical, laboratorial and epidemiological characteristics of patients with co-infection of syphilis and HIV/Aids in a hospital in Recife, in the period between 2015 and 2020.

## MATERIALS AND METHODS

A cross-sectional, retrospective study was conducted at *Hospital-Dia Engenheiro Manoel Figueira*, (Hospital Day) located at the *Instituto de Medicina Integral Prof. Fernando Figueira* (IMIP), a National reference for HIV/AIDS infection. The study was conducted in the period from August to September 2021. The target population

of the research were patients assisted at the Hospital-Day between 2015 and 2020, older than 18 years old and diagnosed with syphilis and HIV infection. Exclusion criteria were patients who had less than 6 months of follow-up and treatment.

Biological variables (age and sex), behavioral variables (age of sexual initiation, sexual orientation, practice of anal sex, sex with a sex professional, number of sexual partners in life, condom use, illicit drug use, smoking, alcoholism, and history of other STIs, such as gonorrhea, trichomoniasis, genital herpes, hepatitis B, hepatitis C, Human Papillomavirus (HPV), and human T-cell lymphotropic virus (HTLV 1 and 2) were analyzed, syphilis-related clinical variables (past infection of syphilis, syphilis diagnostic method, clinical stage of syphilis, and presence of neurosyphilis), syphilis-related laboratory variables (VDRL positivity and VDRL titration), and syphilis-associated therapeutic variables (treatment used, partner's treatment, serological control (standardized reduction or negation), and achievement of cure (absence of symptoms).

The data for the research were obtained by filling out a questionnaire produced by the researchers containing the variables described above. Initially, the patients were interviewed by eight researchers responsible for this research. Then, the patients' medical records, whom the researchers could not contact, but who had been included in the research, were analyzed to obtain the necessary information for the questionnaire. This collecting process, using data from the medical records, was conducted between August and December 2021. Then, the data were compiled and transcribed into the EpiInfo™ Statistical Program version 7.2.5.0.

Measures of central tendency and dispersion were presented as mean and standard deviation. Kolmogorov-Smirnov test was performed to assess normality of distribution. Analysis of associated factors was performed with ANOVA, Student's t test, and chi-square, when applicable, with a significance level of 0.05 or 5%.

The project was submitted to the Ethics Committee of IMIP and respected the principles of bioethics (beneficence, non-maleficence, autonomy, and justice), and the precepts established by the Resolution no. 510/16 of the National Health Council, was approved with the opinion number 52679021.2.0000.5201. For the study, a *Termo de Consentimento Livre e Esclarecido* (TCLE) (Consent Term Form) was requested for the interviewed patients, and a *Termo de Consentimento Livre e Esclarecido* (TCLE) (Consent Term Form) waiver was requested and approved for patients with whom it was not possible to establish contact.

## RESULTS

A total of 171 patients were included, 57.8%

(99/171) were male, with a mean age of  $34.2 \pm 11$  years old. Regarding to occupational status, there was a predominance of unemployed women in relation to men ( $p$  value  $< 0.001$ ). As for marital status, there was a predominance of single men ( $p < 0.001$ ). Regarding color/race, there was a predominance of women who considered themselves mixed colored skin, black or indigenous, when compared to men ( $p$  value  $= 0.017$ ). Regarding patients' place of origin, 88% (132/150) were from Recife or the Metropolitan Area ( $p$  value  $= 0.390$ ).

Regarding to schooling, 30.9% (45/142) had concluded high school, 28.8% (41/145) had incomplete elementary schooling, 17.9% (26/145) had concluded elementary schooling, 14.7% (23/145) had concluded higher education, 4.2% (6/145) had incomplete higher education, 1.4% (2/145) were illiterate, 0.7% (1/145) were literate, 0.7% (1/145) had a post-graduate degree. In regards to sexual orientation, there was a predominance of men who did not consider themselves heterosexual ( $p$  value  $< 0.001$ ). 90 answers were obtained regarding total family income, of which 47.8% (67/90) were below the poverty line (people who live below an income of US\$2.15 per day, according to the World Bank).

Regarding to employment status, there was a predominance of unemployed women when compared to men ( $p$  value  $< 0.001$ ). About family income, there was a predominance of women with income below the poverty line ( $p = 0.032$ ). The sociodemographic characteristics of patients with syphilis and HIV co-infection are described in Table 1.

Most of the patients included in this research, that is, 93.8% (30/32), claimed to have never had sex with sex professionals. When asked about condom use, 11.1% (3/27) reported maintaining a condom use routine, which included using condoms frequently. 47 patients informed on the number of sexual partners and the mean was  $15.5 \pm 8.7$  per patient. Regarding lifestyle habits, there was a predominance of men who did not use illicit drugs routinely or sporadically ( $p$  value  $= 0.026$ ).

Regarding to sexual habits, there was a predominance of men who maintained a practice of anal sex when compared to women ( $p$  value  $< 0.001$ ). Considering the history of other STIs, as evaluated in medical records, 31.2% (39/125) had already had another STI, the most prevalent was hepatitis B, followed by genital herpes and HPV (35.9%, 28.2%, and 20.5%, respectively). Other sexually transmitted infections such as gonorrhea, trichomoniasis, hepatitis C, or lymphogranuloma venereum were found in 1 or 2 patients. When asked about their age at the time of their first intercourse, 49 patients (36 women) responded, with a mean age of  $15.2 \pm 2.2$  years old. In regards to sexual behavior change, in other words, the initiation or resumption of barrier preventive methods against a reinfection, 70.3% (19/23) changed their behavior. The patients' behavioral characteristics with syphilis and HIV co-infection are described in Table 2.

**Table 1** - Sociodemographic characteristics related to syphilis and HIV infection, according to sex, in patients assisted at *Hospital-Dia Engenheiro Manoel Figueira*- IMIP during 2015 and 2020. Recife, October 2022

Variables	N (%)	N (%) Fem.	N (%) Male	p-value
<b>Sex</b>	<b>171</b>	72 (42.1)	99 (57.9)	
<b>Color/race</b>	<b>135</b>	<b>63</b>	<b>72</b>	0.017
White	13 (9.6)	2 (3.1)	11 (15.2)	
Non-white	122 (90.3)	61 (96.8)	61 (84.7)	
<b>Place of Origin</b>	<b>150</b>	<b>61</b>	<b>89</b>	0.390
Recife and Metropolitan area	132 (88.0)	52 (85.2)	80 (89.8)	
Others	12 (12.0)	9 (14.7)	9 (10.1)	
<b>Marital Status</b>	<b>92</b>	<b>46</b>	<b>46</b>	< 0.001
Married/Stable Union	44 (47.8)	32 (69.5)	12 (26.0)	
Unmarried	48 (52.1)	14 (30.4)	34 (74.0)	
<b>Schooling</b>	<b>145</b>	<b>59</b>	<b>86</b>	
Illiterate	2 (1.4)	-	-	
Literate	1 (0.7)	2 (2.3)	-	
Incomplete Elementary schooling	41 (28.3)	-	-	
		1 (1.1)	32 (54.2)	9 (10.4)
Concluded Elementary schooling	26 (17.9)	14 (23.7)	12 (13.9)	
Concluded High School	45 (31.0)	12 (20.3)	33 (38.3)	
Incomplete Higher Education	6 (4.1)	-	-	
		6 (6.9)	-	
Concluded Higher Education	23 (15.9)	1 (1.6)	22 (25.5)	
Post-graduation	1 (0.7)	-	-	
		1 (1.1)	-	
<b>Occupation</b>	<b>154</b>	<b>64</b>	<b>90</b>	<0.001
Employed	58 (37.6)	10 (15.6)	48 (53.3)	
Unemployed	96 (62.3)	54 (84.3)	42 (46.6)	
<b>Family income</b>	<b>90</b>	<b>31</b>	<b>59</b>	0.032
Above poverty line	24 (26.7)	4 (12.9)	20 (33.8)	
Below poverty line	66 (73.3)	27 (87.0)	39 (66.1)	
<b>Sexual orientation</b>	<b>140</b>	<b>56</b>	<b>84</b>	<0.001
Heterosexual	73 (52.1)	51 (91.0)	22 (26.1)	
Non- heterosexual	67 (47.8)	5 (8.9)	62 (73.8)	

About the clinical presentation of syphilis at the time of diagnosis, the predominant form was latent syphilis, with 64.5% (60/93) of the interviewees, followed by secondary, with 20.4% (19/93), primary, with 11.8% (11/93), and tertiary, with 3.2% (3/93). The smallest proportion of patients, that is, 6.6% (5/76), evolved with neurosyphilis during the hospital follow-up period.

In relation to treatment, 97.4% (77/79) of the patients were treated with Benzathine Penicillin G, while 2.5% (2/79) were treated with other second line antibiotics, however, it was not informed the reason of this choice in the medical record. Adherence (confirmation of complete

completion of treatment) occurred in 93.1% (67/72), obtained cure in 94% of the cases (63/67), and serological control in 87.6% (79/89) of cases. When the VDRL titers were analyzed, 79.5% (136/171) of the patients were diagnosed with titers higher than 1/16. Syphilis was treated in the partner in 62.5% (15/24) of the cases. About the form of diagnosis, 38.8% (38/98) of patients reported seeking medical help for unreported reasons, while 33.7% (33/98) were diagnosed through routine consultation, 24.5% (24/98) of the patients presented symptoms, and 3.1% (3/98) of the patients had their sexual partners' diagnosed and were informed.

**Table 2** - Behavioral characteristics in patients with syphilis and HIV co-infection according to sex in patients assisted at *Hospital-Dia Engenheiro Manoel Figueira* - IMIP during 2015 and 2020. Recife, October 2022.

Variables	N (%)	N (%) Fem.	N (%) Male	p-value
<b>Practice anal sex</b>	<b>60</b>	<b>14</b>	<b>46</b>	<0.001
Yes	44 (73.3)	5 (35.7)	39 (84.7)	
No	16 (26.6)	9 (64.2)	7 (15.2)	
<b>Sex with sex professional</b>	<b>32</b>	<b>14</b>	<b>18</b>	0.098
Yes	2 (6.2)	2 (14.2)	-	
No	30 (93.7)	12 (85.7)	18 (100)	
<b>Use of condoms</b>	<b>27</b>	<b>8</b>	<b>19</b>	0.882
Yes	24 (88.8)	7 (87.5)	17 (89.4)	
No	3 (11.1)	1 (12.5)	2 (10.5)	
<b>Other STIs</b>	<b>125</b>	<b>58</b>	<b>67</b>	0.314
Yes	39 (31.5)	15 (25.7)	24 (35.8)	
No	86 (68.8)	43 (74.1)	43 (64.1)	
<b>Which STIs</b>	<b>39</b>	<b>15</b>	<b>24</b>	
HTLV	1 (2.6)	-	-	
Gonorrhea	2 (5.1)	1 (4.1)	-	
Trichomonias	1 (2.6)	-	-	
		2 (8.3)	-	
Genital herpes	11 (28.2)	4 (26.6)	7 (29.1)	
Hepatitis B	14 (35.9)	8 (53.3)	6 (25.0)	
Hepatitis C	1 (2.6)	-	-	
		1 (4.1)	-	
HPV	8 (20.5)	2 (13.3)	-	
LGV	1 (2.6)	6 (25.0)	-	
		-	-	
		1 (4.1)	-	
<b>Use of illicit drugs</b>	<b>95</b>	<b>41</b>	<b>54</b>	0.026
Yes	28 (29.4)	17 (41.4)	11 (20.3)	
No	67 (70.5)	24 (58.5)	43 (79.6)	
<b>Smoking</b>	<b>82</b>	<b>33</b>	<b>49</b>	0.754
Yes	43 (52.4)	18 (54.5)	25 (51.0)	
No	39 (47.5)	15 (45.5)	24 (48.9)	
<b>Alcoholism</b>	<b>80</b>	<b>28</b>	<b>52</b>	0.870
Yes	39 (48.7)	14 (50.0)	25 (48.0)	
No	41 (51.2)	14 (50.0)	27 (51.9)	
<b>Change in sexual behavior</b>	<b>27</b>	<b>6</b>	<b>21</b>	0.822
Yes	19 (70.3)	4 (66.6)	15 (71.4)	
No	8 (29.6)	2 (33.3)	6 (28.5)	

STIs = Sexually transmitted infections; HTLV = Human T cell lymphotropic virus; HPV = Human papillomavirus; LGV = Lymphogranuloma venereum

The clinical stage of syphilis that prevailed in men at diagnosis was latent 58% (36/52), followed by secondary 20.9% (13/62), primary 16.1% (10/52) and tertiary 4.8% (3/62), whereas in women, the clinical form that prevailed was also latent 77.4% (24/31), followed by secondary 19.3% (6/31) and primary 3.2% (1/31). In women, there was no record of tertiary syphilis at the time of diagnosis. All the patients (5/5) who developed neurosyphilis were male. Among the male patients, the mean age at the time of the first intercourse was  $16.6 \pm 2$  years old, a figure that

ranged from 13 to 17 years old. Among female patients, the mean age was  $14.6 \pm 1.9$  years old, which ranged from 11 to 14 years old, showing a tendency of earlier sexual initiation in females.

The VDRL titers found in men did not differ from those found in women (p value=0.293). Partner's treatment occurred in 61.5% (8/13) of the female patients, and 63.6% (7/11) of the male patients (p value=0.914) (Table 3). Syphilis-related characteristics of the patients with syphilis and HIV co-infection are described in Table 3.



**Table 3** - Syphilis-related characteristics in co-infection by syphilis and HIV, according to sex, in patients assisted at *Hospital-Dia Engenheiro Manoel Figueira* - IMIP during 2015 and 2020. Recife, October 2022.

Variables	N (%)	N (%) Female	N (%) Male	p value
<b>VDRL titers</b>	<b>171</b>	<b>72</b>	<b>99</b>	0.293
< 1/16	35 (20.4)	12 (16.6)	23 (23.2)	
> 1/16	136 (79.5)	60 (83.3)	76 (76.7)	
<b>Syphilis treatment</b>	<b>79</b>	<b>28</b>	<b>51</b>	0.289
First-line treatment (Penicillin G Benzathine)	77 (97.4)	28 (100.0)	49 (96.0)	
Other second-line antibiotics	2 (2.5)	-	2 (3.9)	
<b>Syphilis therapy adherence</b>	<b>72</b>	<b>28</b>	<b>44</b>	0.958
Yes	67 (93.0)	26 (92.8)	41 (93.1)	
No	5 (6.9)	2 (7.1)	3 (6.8)	
<b>Partner's treatment for syphilis</b>	<b>24</b>	<b>13</b>	<b>11</b>	0.916
Yes	15 (62.5)	8 (61.5)	7 (63.6)	
No	9 (37.5)	5 (38.4)	4 (36.3)	
<b>Serological control</b>	<b>89</b>	<b>32</b>	<b>57</b>	0.976
Yes	78 (87.6)	28 (87.5)	50 (87.7)	
No	11 (12.3)	4 (12.5)	7 (12.2)	
<b>Obtained cure</b>	<b>67</b>	<b>23</b>	<b>44</b>	0.136
Yes	63 (94.0)	23 (100.0)	40 (90.9)	
No	4 (5.9)	-	4 (9.0)	
<b>Discovery form of syphilis</b>	<b>98</b>	<b>36</b>	<b>62</b>	
Presented symptoms and sought medical care	24 (24.4)	5 (13.8)	19 (30.6)	
Partner was diagnosed and Through routine of medical consultation	3 (3.0)	1 (2.7)	2 (3.2)	
Other means	31 (31.6)	16 (44.4)	17 (27.4)	
<b>Clinical stage of syphilis</b>	<b>38 (38.7)</b>	<b>14 (38.8)</b>	<b>24 (38.7)</b>	
Primary	<b>93</b>	<b>31</b>	<b>62</b>	
Secondary	11 (11.8)	1 (3.2)	10 (16.1)	
Latent	19 (20.4)	6 (19.3)	13 (20.9)	
Tertiary	60 (64.5)	24 (77.4)	36 (58.0)	
<b>Presence of neurosyphilis</b>	<b>3 (3.2)</b>	<b>-</b>	<b>3 (4.8)</b>	0.086
Yes	<b>76</b>	<b>27</b>	<b>49</b>	
No	5 (6.5)	-	5 (10.2)	
<b>Syphilis in the past</b>	<b>71 (93.4)</b>	<b>27 (100.0)</b>	<b>44 (89.7)</b>	0.1914
Yes	<b>87</b>	<b>36</b>	<b>51</b>	
No	34 (39.0)	17 (47.2)	17 (33.3)	
	53 (60.9)	19 (52.7)	34 (66.6)	

VDRL = Venereal Disease Research Laboratory

## DISCUSSION

Co-infection by syphilis and HIV in patients assisted at *Hospital-Dia Engenheiro Manoel Figueira*, at IMIP, was documented. There was a statistically significant difference regarding color/race, with a predominance of mixed colored skin, black or indigenous men, single, or not in a stable union, with income below the poverty line, bisexual or homosexual, who have anal sex, and who do not use illicit drugs. There was also a predominance of unemployed women. No statistical difference was perceived among the other variables studied.

It is known in the literature that syphilis infection increases the chances of HIV infection by up to 3 times, and up to 9 times. This is because of shared risk factors, and the lesions from *Treponema pallidum* infection break down the mucosa and epithelial barriers, facilitating HIV infection, although some researchers believe that the cause of this relation is multifactorial. It is also widely known that co-infection is frequent, especially through shared risk factors<sup>14-16</sup>.

Studies denoting syphilis and HIV co-infection are frequent in the literature, however, most focus on studying patients diagnosed with HIV and assessing the

prevalence of syphilis co-infection<sup>10,11,17-19</sup>. A Turkish study demonstrated that about 12% of the patients with HIV-1 infection had been exposed to *T. pallidum*, whereas about 1% developed non-treponemal tests compatible with syphilis<sup>17</sup>. A German study demonstrated that co-infection occurred in about 20% of the patients with syphilis, at least 75% were MSM<sup>18</sup>. There were also similarities with another Spanish study, which demonstrated that there was a predominance of co-infection with MSM<sup>19</sup>.

In relation to National studies, a Brazilian study from Recife, the same city in which this study was conducted, documented a prevalence of syphilis co-infection in about 18% of the patients with HIV infection, about 85% were men, and residents of the metropolitan area of Recife. However, studies describing this population in more details are still scarce<sup>20</sup>.

This study found similarities in the predominance of men, mixed colored skin, and single, in another Brazilian retrospective study, which also described the clinical and epidemiological characteristics of patients with syphilis and HIV co-infection in a similar period, from 2016 to 2018<sup>21</sup>. Therefore, it can be inferred that the possibility of a true association between co-infection and the epidemiological factors found in these surveys is increasingly plausible.

The predominant clinical stage of syphilis in patients with HIV infection in this study was the latent stage, which is in line with the results of other studies, which found that the main stage of syphilis presentation in patients with HIV was the secondary stage. This may be related to the easy access to the health care, especially in developed countries<sup>22</sup>.

Thus, from a clinical point of view, more aggressive and atypical syphilis lesions, including malignant lues, have been described in seropositive patients<sup>23,24</sup>. However, more recent research has not shown any difference<sup>25</sup>. It is important to emphasize that all cases of neurosyphilis presented in this study corroborate to the findings in the literature, which show that the risk factors for syphilis are men, homosexuals, young and infected with HIV<sup>25,26</sup>.

We highlight the difficulty in obtaining contact with the patients/participants included in the research, possibly due to some of them who live on the street, soon lost contact with the hospital, and for a long period of time without any follow-up in the health unit. Moreover, in relation to the information collected from the medical records (clinical, epidemiological and laboratorial characteristics), we highlight the scarcity of this information related to documented patients, which made data collection difficult. Moreover, we emphasize the small sample size as a limitation, but with very relevant results. Due to the small number of records in the medical records, it is not possible to establish a relation between the clinical figure of syphilis and the HIV viral load and CD4+ T lymphocyte count.

## CONCLUSION

Considering the information obtained in this research on sociodemographic, clinical, laboratorial and therapeutic variables and factors associated with the presentation of syphilis in people with HIV, it was noticed that the most significant data outlined a profile of more prevalent co-infection in mixed colored skin, black or indigenous men, single, with income below the poverty line, bisexual or homosexuals, who have anal sex and do not use illicit drugs. Among women, there was a predominance among unemployed women when compared to men, and the predominant clinical stage of syphilis in HIV patients was latent syphilis. Thus, the epidemiological characteristics of syphilis in people with HIV co-infection continue to predominate in vulnerable populations such as MSM, mixed colored skin, black or indigenous populations, and those with income below the poverty line. Thus, for a better understanding of the profile of people with syphilis and HIV co-infection, it is necessary to carry out more epidemiological studies in this field, and correctly record in the medical records information relevant to the history of the disease during consultations.

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**Participation of the authors in the text:** **Arthur Alencar:** Formal analysis; Investigation, Data curation, Writing - original draft, Visualization **Matheus Magalhães:** Investigation, Data curation, Writing - original draft, Visualization **Hugo Abreu e Lima:** Investigation, Data curation, writing - original draft, Visualization **Edvaldo Souza:** Conceptualization, Methodology, Validation, Formal analysis, Resources, Writing - review and editing, Supervision, Project administration **Jessica Melo:** Validation, Resources, Data curation **Flavia Moraes:** Methodology, Writing - review and Editing, Supervision, Project administration

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