Original Article

TEXTO & CONTEXTO ENFERMAGEM
TEXT & CONTEXT NURSING TEXTO & CONTEXTO ENFERMERÍA

PREVALENCE AND FACTORS ASSOCIATED WITH LATE DIAGNOSIS OF THE HIV INFECTION IN A MUNICIPALITY OF SÃO PAULO

Marcela Antonini[1]
Larissa Gerin[1,2]
Elizabete Santos Melo[3]
Priscila Silva Pontes[1]
Lígia Maria Nascimento Arantes[1,4]
Glenda Roberta Oliveira Naiff Ferreira[5]
Renata Karina Reis[1]

[1]Universidade de São Paulo, Escola de Enfermagem de Ribeirão Preto, Programa de Pós-graduação em Enfermagem Fundamental. Ribeirão Preto, São Paulo, Brasil.
[2]Secretaria Municipal de Saúde de Ribeirão Preto, Divisão de Vigilância Epidemiológica. Ribeirão Preto, São Paulo, Brasil.
[3]Universidade Paulista, Instituto de Ciências da Saúde. São José do Rio Preto, São Paulo, Brasil.
[4]Faculdade de Medicina de Ribeirão Preto, Hospital das Clínicas, Unidade Especializada no Tratamento de Doenças Infecto-Contagiosas. Ribeirão Preto, São Paulo, Brasil.
[5]Universidade Federal do Pará, Faculdade de Enfermagem. Belém, Pará, Brasil.

ABSTRACT

Objective: to identify the prevalence and factors associated with late diagnosis of the infection by the Human Immunodeficiency Virus (HIV), in a municipality of São Paulo.
Method: an epidemiological, analytical and retrospective study that analyzed the HIV and AIDS cases notified by the health services in the period from 2015 to 2017 using data from the notifications of the Information System for Notifiable Diseases (SINAN Net) corresponding to the users recently diagnosed with HIV/AIDS infection in the municipality of Ribeirão Preto/SP, Brazil. Data collection was in May 2018. The chi-square test was performed, as well as binary logistic regression, where the dependent variable was the AIDS criterion at the moment of notifying infection by HIV. A p-value<0.05 was considered for the association between the variables studied in relation to late diagnosis.
Results: of the 829 (100%) new HIV cases, 290 (35.0%) were diagnosed in the condition of AIDS. Most of the population was male and aged between 15 and 34 years old. Oral candidiasis and weight loss greater than 10% were the main symptoms associated with AIDS. It was observed that people with lower schooling levels and older were more prone to late diagnoses.
Conclusion: it is necessary to devise strategies that favor timely diagnosis in the municipality under study, particularly among the individuals aged over 45 years old and with lower schooling levels.

DESCRIPTORS: HIV. HIV infections. Serological tests. Late diagnosis. AIDS-related opportunistic infections. Epidemiology. Health information systems.

HOW CITED: Antonini M, Gerin L, Melo ES, Pontes PS, Arantes LMN, Ferreira GRON, Reis RK. Prevalence and factors associated with late diagnosis of the HIV infection in a municipality of São Paulo. Texto Contexto Enferm [Internet]. 2022 [cited YEAR MONTH DAY]; 31:e20200579. Available from: https://doi.org/10.1590/1980-265X-TCE-2020-0579.

PREVALÊNCIA E FATORES ASSOCIADOS AO DIAGNÓSTICO TARDIO DA INFECÇÃO PELO HIV EM UM MUNICÍPIO PAULISTA

RESUMO

Objetivo: identificar a prevalência e os fatores associados ao diagnóstico tardio da infecção pelo vírus da imunodeficiência humana (HIV), em um município do interior paulista.
Método: estudo epidemiológico, analítico e retrospectivo que analisou os casos de HIV e AIDS notificados pelos serviços de saúde no período de 2015 a 2017 por meio dos dados das notificações do Sistema de Informação de Agravos de Notificação (Sinan Net) dos usuários recém-diagnosticados para a infecção pelo HIV/AIDS no município de Ribeirão Preto/SP, Brasil. A coleta de dados ocorreu em maio de 2018. Foi realizado o teste qui-quadrado e regressão logística binária, no qual a variável dependente foi o critério de AIDS no momento da notificação da infecção pelo HIV. Foi considerado o valor de $p<0,05$ para a associação entre as variáveis estudadas com relação ao diagnóstico tardio.
Resultados: dentre os 829 (100%) casos novos de HIV, 290 (35,0%) foram diagnosticados na condição de AIDS. A maioria da população pertencia ao sexo masculino e na faixa etária dos 15 aos 34 anos. A candidose oral e a perda de peso acima de 10% foram os principais sintomas associados à AIDS. Observou-se que pessoas com menor escolaridade e com o aumento da idade eram mais propensas a serem diagnosticadas tardiamente.
Conclusão: estratégias que favoreçam o diagnóstico oportuno no município estudado são necessárias, particularmente entre os indivíduos com idade acima de 45 anos e com menor escolaridade.

DESCRITORES: HIV. Infecções por HIV. Testes sorológicos. Diagnóstico tardio. Infecções oportunistas relacionadas com a AIDS. Epidemiologia. Sistemas de informação em saúde.

PREVALENCIA Y FACTORES ASOCIADOS AL DIAGNÓSTICO TARDÍO DE LA INFECCIÓN OCASIONADA POR EL VIH EN UN MUNICIPIO DE SAN PABLO

RESUMEN

Objetivo: identificar la prevalencia y los factores asociados al diagnóstico tardío de la infección ocasionada por el Virus de Inmunodeficiencia Humana (HIV) en un municipio del interior de Brasil.
Método: estudio epidemiológico, analítico y retrospectivo que analizó los casos de VIH y SIDA notificados por los servicios de salud entre 2015 y 2017 por medio de los datos de las notificaciones del Sistema de Información de Problemas de Salud pasibles de Notificación (SINAN Net) referentes a los usuarios recién diagnosticados con la infección ocasionada por el VIH/SIDA en el municipio de Ribeirão Preto/SP, Brasil. La recolección de datos fue en mayo de 2018. Se realizaron tanto una prueba de chi-cuadrado como un análisis de regresión logística binaria, en la cual la variable dependiente fue el criterio de SIDA al momento de notificar la infección ocasionada por el HIV. Se consideró un valor de $p<0,05$ para la asociación entre las variables estudiadas en relación con el diagnóstico tardío.
Resultados: entre los 829 (100%) casos nuevos de HIV, 290 (35,0%) fueron diagnosticados en la condición de SIDA. La mayoría de la población era del sexo masculino y pertenecía al grupo etario de 15 a 34 años. Candidiasis oral y pérdida de peso superior al 10% fueron los principales síntomas asociados al SIDA. Se observó que las personas con niveles de educación más bajos y de mayor edad fueron más propensas a ser diagnosticadas tardíamente.
Conclusión: es necesario elaborar estrategias que favorezcan el diagnóstico oportuno en el municipio estudiado, particularmente entre las personas de más de 45 años de edad y con niveles de educación más bajos.

DESCRIPTORES: VIH. Infecciones ocasionadas por el VIH. Exámenes serológicos. Diagnóstico tardío. Infecciones oportunistas relacionadas con el SIDA. Epidemiología. Sistemas de información en salud.

INTRODUCTION

Since the beginning of the epidemic of the Human Immunodeficiency Virus (HIV) infection, 79.3 million people have been infected and 36.3 million have died due to AIDS worldwide, according to the Joint United Nations Programme on HIV/AIDS (UNAIDS). In 2020, there were 1.5 million new cases of the virus and 680,000 AIDS-related deaths, highlighting the need to seek strategies to change this situation[1].

Brazil was the first developing country to offer free and universal access to the antiretroviral therapy (ART), tests and care for people diagnosed with HIV infection[2]. Despite this, the number of cases notified is growing and, in 2019, there were 50,838 new cases of HIV and 15,923 of AIDS, corresponding to 51.3% and 19.9% of the cases in the Southeast and South regions, respectively[2–3]. In addition, a significant number of people continue to be diagnosed at an advanced stage of the HIV infection. In 2020, for example, 27% of the cases corresponded to late diagnoses[2–3].

Diagnosis of the HIV infection is considered late when the person is found to be seropositive with a TCD4+ lymphocyte count below 350 cells/mm³ and/or with any AIDS-defining disease[4]. Its occurrence is related to the selection for resistance to the antiretroviral drugs, to lower immunological recovery when compared to people who are diagnosed early and with fast treatment initiation, and to greater chance of death due to AIDS or other associated diseases[5–6].

Therefore, timely diagnosis is fundamental to maximize the therapeutic benefits of ART to restore immunity, aiming at a better prognosis for people living with HIV (PLHIV)[1,5,7]. In this context, access to HIV/AIDS testing and counseling was established as one of the priorities to control the epidemic in the world[5,7]. In Brazil, the public policies to fight against HIV provide testing, counseling, clinical follow-up, access to ART, HIV sexual prevention supplies, including condoms and pre- and post-sexual exposure prophylaxis, among others, in the different services of the health care networks, in addition to health units specialized in the treatment of people living with the virus, through the Unified Health System (*Sistema Único de Saúde*, SUS)[8].

However, challenges remain in order to improve access to testing and many people continue to be late diagnosed for HIV infection, implying treatment initiation, on average, nearly eight years after the infection and leading to AIDS-related deaths. In low- and middle-income countries, nearly 30% to 40% of the PLHIV who start ART have a TCD4+ lymphocyte count below 200 cells/mm³ or already have some AIDS-related disease[5,7,9], evidencing that the epidemiological situation of HIV still challenges the current efforts to fight against the epidemic and, therefore, it is necessary to question and reflect on the public policies and the current production of care aimed at the HIV/AIDS epidemic.

In this aspect, Collective Health as a field enables fruitful reflections on the way of thinking and producing care as a live action[10] whose main axis are the biological, political and social aspects as determinants of the social production of health and disease[11–12], and, therefore, has a lot to contribute to the challenge of late HIV diagnosis.

In Brazil, nurses are proficient in care in the different phases of the life cycle and are references in the development of collective strategies, in team management and in the implementation of assistance protocols, in addition to being protagonists in the systematic collection of data on the health of the population that will be useful to compose the epidemiological indicators[13],therefore playing a fundamental role in thinking and proposing favorable strategies for timely diagnosis and effective connection to the care and treatment for HIV, as they outline the health actions based on the epidemiological indicators and on the demands of the geographical areas where they work.

In this context, we proposed this study to identify the prevalence and factors associated with late diagnosis of the HIV infection in a municipality from the inland of São Paulo in the period from 2015 to 2017. It is hoped that this study will contribute to the evidence regarding diagnosis of HIV and AIDS, as well as it fosters reflections on the current production of care aimed at fighting against the HIV/AIDS epidemic.

METHOD

This is an epidemiological, analytical and retrospective study that analyzed the HIV and AIDS cases recently diagnosed and notified by the health services in the municipality of Ribeirão Preto - SP from 2015 to 2017.

Data collection took place in May 2018. The HIV and AIDS records among people aged 13 years old and over were consulted, reported to the Information System for Notifiable Diseases (SINAN Net)[14] from January 1st, 2015, to December 31st, 2017, in the municipality under study. The data were extracted from the system by the Epidemiological Surveillance team of the Municipal Secretariat in an Excel spreadsheet and provided to the researcher. It is noted that the data collected from the system and made available to the researcher strictly contemplated the variables of interest to the study, ensuring anonymity of the cases.

In the 2015-2017 period, the municipality entered 1,299 HIV/AIDS notifications in SINAN Net. However, to ensure that the study sample consisted only of the recently diagnosed cases, the notifications in which the interval between the HIV/AIDS diagnosis and the notification date was over one month were excluded, resulting in 829 cases that constituted the sample of this study.

SINAN Net[14] is an information system powered mainly by the notification and investigation of diseases and conditions of compulsory notification in Brazil. Its systematic and decentralized use contributes to democratization of the information, allowing access for professionals from all levels of health care assistance[14]. Therefore, it is a relevant instrument to assist in health planning and to define intervention priorities, in addition to allowing the impact of the interventions to be evaluated[14].

In the case of the HIV infection, the SINAN Net AIDS notification/investigation form records data on the notification date, the HIV infection and/or AIDS diagnosis date and the TCD4 cell count, in addition to the individual's sociodemographic and clinical characteristics at the time of notification.

The parameters used to define HIV/AIDS diagnosis include a combination of clinical and immunological aspects, which aim to identify the progression phase of the infection[4–5]. Thus, Late Diagnosis (DT) was defined as any case that received a diagnoses of HIV infection with a TCD4+ cell count below 350 cells/mm³ of blood, and/or that presented clinical symptoms of HIV-associated opportunistic diseases according to the Adapted CDC criterion and to the Rio de Janeiro/Caracas criterion, as defined by the Ministry of Health[4].

The variables of interest were the same as those included in the AIDS notification/investigation form from the Ministry of Health's SINAN Net, and they were related to the sociodemographic data: sex at birth, age, skin color (white, black, brown and Asian) and schooling (illiterate, elementary school, high school and higher education); clinical-epidemiological data: criterion (HIV or AIDS), HIV infection or AIDS diagnosis date; type of exposure to the virus (sexual, vertical, accident with biological material, use of injectable drugs, blood transfusion), use of injectable drugs (yes/no), AIDS-defining diseases according to the Adapted CDC and Rio de Janeiro/Caracas criteria, and TCD4+ lymphocyte count (above or below 350 cells/mm³).

The data obtained by means of a Microsoft Excel spreadsheet were coded and exported to the Statistical Package for the Social Sciences (SPSS) program, version 22.0. To verify the association between the variables of interest and the HIV and AIDS criterion, the Chi-square test or the G test was performed, and the variables that presented statistical significance were used in the binary logistic

regression, where the dependent variable was the criterion (HIV/AIDS), AIDS being used as binary response 1 or success. The tests in which a significance level below 5% ($p<0.05$) was obtained were considered significant. Throughout the study, the data categorized as "Unknown" were excluded from the association or logistic regression tests, as they represent absence of data in the notification forms.

The project was approved by the Research Ethics Committee of the Ribeirão Preto Nursing School and by the Municipal Health Secretariat of Ribeirão Preto - SP, in compliance with Resolution 466/2012. As the study dealt with secondary data, waiver regarding use of the Free and Informed Consent Form (FICF) was approved.

RESULTS

From January 1st, 2015, to December 31st, 2017, the municipality under study entered 1,299 notifications of HIV/AIDS cases in SINAN Net, with 829 (100%) referring to those recently diagnosed cases that constituted the sample of this study. The prevalence of late diagnosis was 35%, that is, detection of the seropositive state for HIV already occurred in the condition of AIDS.

In general, most of the new cases were in white-skinned individuals (490; 59.1%), male (627; 75.6%) and aged from 15 to 34 years old (628; 75.7%), with a mean age of 30.33 years old (SD±11.82) and having completed high school (230; 27.7%). However, it is noticed that the number of AIDS cases was relatively higher among those aged over 45 years old and/or with lower schooling levels (Table 1). The association of AIDS late diagnosis was significant with age group ($p<0.0006$) and with schooling ($p<0.0001$), as can be seen in Table 1.

Table 1 – Sociodemographic data of people recently diagnosed with HIV and its association with the HIV/AIDS criterion, in the municipality of Ribeirão Preto, SP, Brazil, during the 2015-2017 period. (n=829)

Variables		Criterion			p-value
		HIV	AIDS	Total	
		n=539 (65,0%)	n=290 (35,0%)	n=829 (100%)	
Gender	Female	121 (59,9)	81 (40,1)	202 (100)	0,09*
	Male	418 (66,7)	209 (33,3)	627 (100)	
Age group	15-24	244 (69,7)	106 (30,2)	350 (100)	**<0,0006***
	25-34	182 (65,4)	96 (34,5)	278 (100)	
	35-44	71 (65,1)	38 (34,8)	109 (100)	
	45-59	16 (40,0)	24 (60,0)	40 (100)	
	60+	26 (50,0)	26 (50,0)	52 (100)	
Skin color	White	305 (62,2)	185 (37,7)	490 (100)	0,121†
	Brown	106 (70,6)	44 (29,3)	150 (100)	
	Black	36 (54,5)	30 (45,4)	66 (100)	
	Asian	04 (66,6)	02 (33,3)	06 (100)	
	Unknown	88 (75,2)	29 (24,7)	117 (100)	
Schooling	Illiterate	01 (33,3)	02 (66,6)	03 (100)	**<0,0001†**
	Elementary School	90 (49,2)	93 (50,8)	183 (100)	
	High School	152 (66,0)	78 (33,9)	230 (100)	
	Higher Education	122 (73,9)	43 (26,0)	165 (100)	
	Unknown/NI	174 (70,1)	74 (29,8)	248 (100)	

The data categorized as Unknown were not included in the statistical analysis. *Chi-Square Test. †G Test. NI=No Information.

In this same period, there was no record of probable blood-borne transmission of cases due to hemophilia or to accidents with biological material. Sexual contact (710; 85.6%) was the main type of HIV exposure and there was no significant difference in the number of AIDS cases among those who had sex with people of the same sex (360; 43.4%) or with the opposite sex (321; 38.7%) (Table 2).

A TCD4+ lymphocyte count above 350 cells/mm^3 was associated (p<0.001) with having been diagnosed with HIV. Intriguingly, our findings show that, among the cases diagnosed in the condition of AIDS, some (23; 6.0%) presented at least two AIDS-defining diseases concomitantly with TCD4+ lymphocyte counts above 350 cells/mm³, as shown in Table 2.

As for the clinical manifestations, the variables referring to the Rio de Janeiro/Caracas criterion were more frequently found in the AIDS cases when compared to those referring to the Adapted CDC criterion.

In general, the most frequent symptoms found in the AIDS cases were cachexia or weight loss greater than 10% (47; 16.2%) and oral candidiasis or hairy leukoplakia (35; 12.1%), as shown in Table 3.

In the multivariate analysis (Table 4), it is observed that individuals aged between 45 and 59 years old (OR=3.45 [1.76; 6.76]) and over 60 years old (OR=2.30 [1.28; 4.15]), as well as with lower schooling levels (OR=2.96 [1.89; 4.65]), were more likely to be late diagnosed.

Table 2 – Data regarding the form of HIV infection of people recently diagnosed with the virus and its association with the HIV/AIDS criterion at the time of diagnosis, in the municipality of Ribeirão Preto, SP, Brazil, during the 2015-2017 period. (n=829)

Variables		Criterion			p-value
		HIV	AIDS	Total	
		n=539 (65,0%)	n=290 (35,0%)	n=829 (100%)	
Use of injectable drugs	No	436 (67,2)	212 (32,7)	648 (100)	0,233*
	Yes	11 (52,3)	10 (47,6)	21 (100)	
	Unknown	92 (57,5)	68 (42,5)	160 (100)	
Blood transfusion	No	437 (65,6)	229 (34,3)	666 (100)	0,747†
	Yes	01 (100)	-	01 (100)	
	Unknown	101 (62,3)	61 (37,6)	162 (100)	
Has sex with	People of both sexes	14 (66,6)	07 (33,3)	21 (100)	0,183
	People of the opposite sex	202 (62,9)	119 (37,0)	321 (100)	
	People of the same sex	256 (69,5)	112 (30,4)	368 (100)	
	Unknown	67 (56,3)	52 (43,6)	119 (100)	
TCD4+ lymphocyte count	Above 350 cells/mm³	360 (94,0)	23 (6,0)	383 (100)	**<0,001†**
	Below 350 cells/mm³	-	249 (100)	249 (100)	
	Unknown	179 (90,9)	18 (9,1)	197 (100)	

The data categorized as Unknown were not included in the statistical analysis. *Chi-Square Test. †G Test.

Table 3 – AIDS-defining diseases, according to the Rio de Janeiro/Caracas and Adapted CDC criteria, of people recently late diagnosed with HIV/AIDS in the municipality of Ribeirão Preto, SP, Brazil, in the 2015-2017 period. (n=290)

Adapted CDC Criterion		f	%	Rio de Janeiro / Caracas Criterion		f	%
Invasive cervical cancer	No	280	96.6	Kaposi's Sarcoma	No	246	84.4
	Yes	01	0.3		Yes	12	4.1
	Unknown	09	3.1		Unknown	32	11.0
Esophageal candidiasis	No	242	83.4	Disseminated/ Extra-pulmonary/ Non-cavitary tuberculosis	No	249	85.9
	Yes	13	4.5		Yes	10	3.4
	Unknown	35	12.1		Unknown	31	10.7
Cytomegalovirus*	No	246	84.8	Oral candidiasis or hairy leukoplakia	No	225	77.6
	Yes	06	2.1		Yes	35	12.1
	Unknown	38	13.1		Unknown	30	10.3
Tracheal, bronchial or lung candidiasis	No	251	86.6	Cavitary or unspecified tuberculosis	No	241	83.1
	Yes	02	0.7		Yes	20	6.9
	Unknown	37	12.8		Unknown	29	10.0
Extra-pulmonary cryptococcosis	No	244	84.1	Herpes zoster in individual ≤ 60 years old	No	253	87.2
	Yes	08	2.8		Yes	07	2.4
	Unknown	38	13.1		Unknown	30	10.0
Chronic intestinal cryptosporidiosis > 1 month	No	250	86.2	Dysfunction of the Central Nervous System	No	255	87.9
	Yes	01	0.3		Yes	06	2.1
	Unknown	39	13.4		Unknown	29	10.0
Mucocutaneous herpes simplex > 1 month	No	249	85.9	Diarrhea ≥ 1 month	No	236	81.4
	Yes	03	1.0		Yes	25	8.6
	Unknown	38	13.1		Unknown	29	10.0
Disseminated histoplasmosis	No	250	86.2	Fever of 38 ºC or more for ≥ 1 month	No	233	80.3
	Yes	03	1.0		Yes	25	8.6
	Unknown	37	12.8		Unknown	32	11.0

Table 3 – Cont.

Adapted CDC Criterion		f	%	Rio de Janeiro / Caracas Criterion		f	%
Primary brain lymphoma	No	252	86.9	Cachexia or weight loss greater than 10%	No	213	73.4
	Yes	01	0.3		Yes	47	16.2
	Unknown	37	12.8		Unknown	30	10.3
Disseminated mycobacteriosis†	No	250	86.2	Astenia for at least 1 month	No	236	81.4
	Yes	02	0.7		Yes	23	7.9
	Unknown	38	13.1		Unknown	31	10.7
Pneumonia due to *Pneumocystis carini*	No	233	80.3	Persistent dermatitis	No	255	87.9
	Yes	18	6.2		Yes	04	1.4
	Unknown	39	13.4		Unknown	31	10.7
Chagas disease reactivation‡	No	252	86.9	Anemia and/or lymphopenia and/or thrombocytopenia	No	232	80.0
	Yes	01	0.3		Yes	25	8.6
	Unknown	37	12.8		Unknown	33	11.4
Salmonellosis§	No	252	86.9	Persistent coughing or any pneumonia	No	234	80.7
	Yes	01	0.3		Yes	26	9.0
	Unknown	37	12.8		Unknown	30	10.3
Brain toxoplasmosis	No	238	82.1	Lymphadeno-pathy ≥ 1 cm, ≥ to two extra inguinal sites and for ≥ 1 month	No	241	83.1
	Yes	13	4.5		Yes	13	4.5
	Unknown	39	13.4		Unknown	36	12.4
Total		290	100	Total		290	100

*(Except liver, spleen or lymph nodes). †(Except tuberculosis and leprosy). ‡(Meningoencephalitis and/or myocarditis). §(Non-typhoid recurrent sepsis).

Table 4 – Final model, according to logistic regression, of the assessment of the factors associated with late diagnosis of the HIV infection. Ribeirão Preto, SP, Brazil, 2015 - 2017. (n=290)

Sociodemographic Variables		OR* (95% CI†)	p-value
Age group	15-24	Ref.	
	25-34	1.21 (0.87; 1.70)	0.258
	35-44	1.23 (0.78; 1.94)	0.369
	45-59	3.45 (1.76; 6.76)	**<0,0001**
	60+	2.30 (1.28; 4.15)	**0.006**
Schooling	Illiterate/Elementary School	2.96 (1.89; 4.65)	**<0,0001**
	High School	1.46 (0.94; 2.27)	0.096
	Higher Education	Ref.	

*OR: Odds ratio; †CI: Confidence Interval.

DISCUSSION

The profile of the population studied was predominantly young male adults, in agreement with the national data[3], which show an increase in the number of cases in this same population, as well as with other studies that address the issue of HIV/AIDS diagnosis[15–16].

In this study, the prevalence of late diagnosis was 35%, lower than that observed in another study conducted in the state of Paraíba[15] and higher than the national rate of 26% which has remained unchanged since 2015, according to the HIV clinical monitoring indicators presented by the Ministry of Health[3].

At this same period (from 2015 to 2021) in Brazil, most cases of late HIV diagnosis happenedin people over 40 years of age, brown-skinned, and with lower schooling levels[3].

In 2010, a speculation about a possible “end of AIDS” achievement emerged as an accessible goal in the global efforts to control the HIV epidemic through biomedical strategies such as Treatment as Prevention (TasP), in addition to the immediate offer of ART regardless of the TCD4+ lymphocyte count[5,17]. In fact, these strategies are indispensable in restoring immunity and improving the biological condition of PLHIV;[18] however, they do not end the AIDS problem as a whole, as the possibility of contagion remains.

Thus, almost 40 years after the beginning of the AIDS epidemic, the number of people who acquire HIV, fall ill and die continues to grow, suggesting that the strategies to fight against the epidemic are insufficient and exclusive[17,19], as the “efforts” made in the fight to put an end to the epidemic do not address the social determinants of the individual and collective health needs that make up situations of vulnerability to HIV/AIDS[17].

Late diagnosis is associated with barriers that prevent or delay the individual’s access to care, which include social status, transportation costs and distance to the health service, stigma, fear of disclosure, lack of support and long waiting periods, deficient referrals, stigmatizing or hostile services and dependence on alcohol and on illicit drugs, as well as political and legal barriers that can hinder access to care[5,7].

In addition, AIDS is still seen as a communicable and dangerous disease that affects “the other”, causing a feeling of invulnerability in people and, therefore, these representations of the disease can favor late search for a diagnosis in the health services[20]. On the other hand, it is a disease that runs silently for a period of time and that can manifest itself only in the presence of immunosuppression.

In our findings, people aged over 45 years old presented more chances of late diagnosis when compared to younger individuals. This result corroborates the findings of another study[16] and reinforces the need to develop a care perspective capable of overcoming the stigma of the HIV epidemic restricted to young people with a homo-affective sexual orientation.

Although most of the HIV cases in Brazil occur in the age group of 20 to 34 years old and the highest concentration of AIDS cases is observed in individuals between 25 and 39 years old, the age group of men over 60 years old presented an increase in the AIDS detection rate during the last 10 years in the country[2–3].

The taboos, myths, beliefs and prejudices related to the sexuality of older adults contribute to health professionals not addressing these issues with this population, who often have their sex life unknown, which collaborates to not conducting counseling on prevention strategies, as well as to not offering screening tests for HIV[21–23].

This circumstance raises even more concerns considering the Brazilian demographic transition of population aging. Maintenance of the population's sexual activity, even after reaching the advanced age phase, is already well established in the scientific literature[16,20–23], reinforcing the need to address issues related to sexuality and health promotion among older adults, in addition to offering screening tests in medical and nursing consultations at all health care levels[21]. However, there are barriers also related to not addressing sexuality in the context of the care provided by the health team[21–22], which contributes to possible confusions and delays in the diagnosis of HIV, as well as of other STIs.

It is important to perform the HIV screening test, as the possibility of early diagnosis and treatment contributes to reducing spread of the virus among people, in addition to the benefits for the individual[24]. However, there is still a large number of people who are unaware of their serological condition and who might benefit from ART, achieve viral suppression and, consequently, contribute to reducing HIV transmission in the population[15].

Expanding the offer of HIV diagnostic tests among people aged over 45 years old can be a potentiating factor for early diagnosis[25]. However, given the current weaknesses in health care related to sexuality, it becomes necessary to reformulate, as well as invest in, the training of health professionals so that they know how to deal with these demands with respect and integrity.

In our findings, people with worse social conditions, such as lower schooling levels (OR=2.96 [1.89; 4.65]), were more likely to receive a late diagnosis of HIV infection, similarly to what has been observed in other studies[16,26] and in the country[2–3].

Schooling is related to access to and understanding of the information, as well as to the possibility of using it to identify risk situations and adopting health protection practices[27]. In addition to that, low schooling is associated with low wages and with precarious socioeconomic conditions, a fact that limits the opportunity to access services and goods[27].

Analyzing the data made available by the Ministry of Health (2020), it is noted that, from 2000 to 2020, most of the new HIV cases were in people with complete high school; however, the AIDS cases in the same period were concentrated in people with lower schooling levels[2–3], suggesting that, despite the epidemic reaching all population groups, the individuals with less purchasing power are those who most contract and suffer the disease, once again reinforcing the discussion that the strategies to fight against the epidemic are insufficient and exclusive.

Given this, the Brazilian scenario is worrying since, according to the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, IBGE), until 2019, only 11,773,203 adults had completed high school,10,974,667 had completed elementary school and 24,093,776 were illiterate[28].

In addition to a TCD4+ lymphocyte count below 350 cells/mm³, there are several AIDS-defining diseases and symptoms that suggest a severely immunocompromised state[18]. In our study, cachexia or weight loss greater than 10% (47; 16.2%) and oral candidiasis or hairy leukoplakia (35; 12.1%) were the symptoms more frequently found among the late diagnosed cases, similarly to the findings of other studies on HIV infection and AIDS[15,18–19,29].

Oropharyngeal candidiasis is reported as a primary clinical oral manifestation of AIDS, affecting from 50% to 95% of the people who acquire HIV and, for this reason, it plays a significant role in diagnosis and progression of the disease[18–19]. In addition, cachexia or weight loss above 10% is also frequently reported in studies on AIDS[29], being considered as a classic AIDS symptom since the beginning of the epidemic.

Interestingly, we noticed that, among the cases diagnosed in the condition of AIDS, some presented at least two AIDS-defining diseases and TCD4+ lymphocyte counts above 350 cells/mm³. A study conducted in Duala (Cameroon) identified that up to 15% of its participants were diagnosed with AIDS in this same situation[30].

This finding is important, as the therapeutic courses of action differ according to the HIV infection criterion and, consequently, they imply different prognoses. That is because the immune deficit coexisting with AIDS enables complications that go beyond the immune system (such as those of a pulmonary, cardiovascular and neurological nature) and which tend to worsen over time when left untreated[18]. For this reason, late diagnosis implies from greater burden of morbidity and mortality associated with HIV infection to a reduction in quality and estimate of life due to AIDS-related disabilities[1,5–6,18].

It is important to emphasize that the current techno-scientific advances aimed at fighting against the HIV epidemic do not overlap with the light technologies that play a key role in this scenario. Counseling in health, for example, is a practice present in the care relationships, with the potential to recognize situations of vulnerability and to seek, in a shared way, answers and solutions appropriate to their demands[31] and, therefore, it is also considered as a virtuous strategy for confronting the epidemic of HIV/AIDS infection and for timely diagnosis.

In this sense, the Nursing team plays a fundamental role because they are the first professionals with whom the population has contact when they seek health care.

In addition to that, in Brazil, nurses are empowered to welcome, advise and test the population for HIV and other Sexually Transmitted Infections (STIs), as well as to request laboratory tests for the complementary diagnosis of the testing and monitoring of infections, in addition to prescribing antiretroviral drugs for the sexual Pre-Exposure Prophylaxis (PrEP) of HIV, as provided for in the Ministry of Health's technical manuals and protocols[8,32–33].

Regarding the Nursing perspectives as a category, this is encouraging, as it evidences professional qualification and autonomy for the care practice. However, centralization of the strategies to fight against HIV on this professional category in primary care services has negatively affected both the work process and production of care[31].

Discussing the issue of late diagnosis goes beyond pointing out statistical data and reinforcing activities that have already been implemented, as it is a multifactorial problem, which is not responsibility of only one professional category or governmental instance. Strengthening programs and public policies aimed at fighting against HIV/AIDS are indeed relevant; however, it is necessary to go beyond the existing strategies, bearing in mind that the health and disease process is directly linked to the socioeconomic and cultural conditions of the individuals[12].

The implementation of new proposals must consider the complexity of the work process in health as a live action[10,31] so that the actions are not centralized in only one professional category. It is necessary that public policy makers, managers and health professionals from all areas work in an integrated manner and that they understand co-responsibility for this challenge.

In addition, in this study, a significant frequency of information classified as "Unknown" in the notification forms was observed, similarly to the findings of other Brazilian studies[34] and to the national data[3]. This classification can correspond either to fields without information, or to information unknown by the informant.

Transposing this problem to the national level, ignoring the data in the notification forms can result in a loss in the characterization and monitoring of trends, the epidemiological profile and the risks and vulnerabilities of the population, which may affect the foundational character that this information has in the construction of public policies to fight against the disease[35]. In the health area, the planning, monitoring, execution and evaluation of concrete actions with a focus on both preventive and resolute results come from diverse information that makes it possible to estimate relevant indicators about a given health situation, hence the importance of obtaining accurate and complete[30].

The reason why these data were filled out as "Unknown" has not been elucidated, not knowing whether the patient refused to provide the information or whether the professional was unwilling to investigate it. However, it is known that it is possible that the notification form is filled out without the individuals being present or by professionals who had no contact with them. Therefore, filling out the notification form at the time of diagnosis by the professional who informs the diagnosis to the individual can reduce underreporting and incomplete filling out of the form, thus improving quality of the data.

Our study must be interpreted in the light of some limitations. The data identified as "Unknown" in the notification forms may underestimate our findings and the period referring to the data collected can also be considered a limitation. However, this does not invalidate the analyses and reflections raised, as these are official data and the notifications from the subsequent years maintained a profile similar to that of the period studied.

CONCLUSION

Our findings show that, from 2015 to 2017, 35% of the new HIV cases in the municipality under study were late diagnoses. The individuals aged over 45 years old and with lower schooling levels presented more chances of late diagnoses in the AIDS condition.

It is necessary to rethink production of care and strategies that favor greater access to the health services and HIV testing, in addition to improving the quality of counseling in health. Permanent education of the health professionals, especially the Nursing team, should emphasize the importance of early diagnosis to face the epidemiological situation of HIV, as well as for a better prognosis for those living with the virus.

REFERENCES

1. Joint United Nations Programme on HIV/AIDS (UNAIDS). Global HIV & AIDS statistics - Fact Sheet 2021. [Internet]. 2021 [cited 2021 Sep 18]. Available from: https://www.unaids.org/en/resources/fact-sheet
2. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Departamento de Doenças de Condições Crônicas e Infecções Sexualmente Transmissíveis (DCCI). Relatório de monitoramento clínico do HIV. [Internet]. Brasília, DF(BR): Ministério da Saúde; 2019 [cited 2020 Oct 3]. Available from: http://www.aids.gov.br/pt-br/pub/2019/relatorio-de-monitoramento-clinico-do-hiv-2019
3. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Painel de Indicadores Epidemiológicos: Aids; Clínico de HIV - dados regionais e nacionais. [Internet]. Brasília, DF(BR): Ministério da Saúde; 2021 [cited 2021 Oct 1]. Available from: http://www.aids.gov.br/pt-br/gestores/painel-de-indicadores-epidemiologicos
4. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Manual Técnico para o Diagnóstico da Infecção pelo HIV. Brasília, DF(BR): Ministério da Saúde; 2016 [cited 2020 Sep 20]. Available from: http://www.aids.gov.br/pt-br/node/57787
5. World Health Organization (WHO). Consolidated guidelines on HIV testing services: 5Cs: consent, confidentiality, counselling, correct results and connection 2015. [Internet]. Geneva: World Health Organization; 2015 [cited 2021 Jan 27]. Available from: https://apps.who.int/iris/handle/10665/179870
6. Croxford S, Kitching A, Desai S, Kall M, Edelstein M, Skingsley A, et al. Mortality and causes of death in people diagnosed with HIV in the era of highly active antiretroviral therapy compared with the general population: an analysis of a national observational cohort. Lancet Public Health [Internet]. 2017 Jan [cited 2020 Oct 4];2(1):e35-e46. Available from: https://doi.org/10.1016/S2468-2667(16)30020-2
7. World Health Organization (WHO). Guidelines for managing advanced hiv disease and rapid initiation of antiretroviral therapy. [Internet]. Geneva: World Health Organization; 2017 [cited 2021 Nov 10]. Available from: https://www.who.int/hiv/pub/guidelines/advanced-HIV-disease/en/
8. Ministério da Saúde (BR). Departamento de Doenças de Condições Crônicas e Infecções Sexualmente Transmissíveis. Diretrizes para a organização do CTA no âmbito da prevenção combinada e nas redes de atenção à saúde. [Internet]. Brasília: Ministério da Saúde; 2017 [cited 2021 Nov 10]. Available from: http://www.aids.gov.br/pt-br/gestores/diretrizes-para-organizacao-e-funcionamento-dos-cta-no-ambito-da-prevencao-combinada
9. Siwak E, Horban A, Witak-Jędra M, Cielniak I, Firląg-Burkacka E, Leszczyszyn-Pynka M, et al. Long-term trends in HIV care entry: over 15 years of clinical experience from Poland. HIV Med [Internet]. 2019 Oct [cited 2020 Sep 22];20(9):581-90. Available from: https://doi.org/10.1111/hiv.12762
10. Merhy EE, Feuerwerker LCM, Santos MLDM, Bertussi DC, Baduy RS. Rede Básica, campo de forças e micropolítica: implicações para a gestão e cuidado em saúde. Saude Debate [Internet]. 2019 [cited 2021 Sep 18];43(spe 6):70-83. Available from: https://doi.org/10.1590/0103-11042019S606
11. Osmo A, Schraiber LB. The field of collective health: definitions and debates on its constitution. Saude Soc [Internet]. 2015 Apr-Jun [cited 2021 Sep 18];24(suppl 1):205-18. Available from: https://doi.org/10.1590/S0104-12902015S01018
12. Carrapato P, Correia P, Garcia B. Health determinants in Brasil: searching for health equity. Saude Soc [Internet]. 2017 Jul-Sep [cited 2021 Sep 18];26(3):676-89. Available from: https://doi.org/10.1590/S0104-12902017170304

13. Fortuna CM, Mishima SM, Rodriguez AMMM, Matumoto S. Collective health nursing: desires and practices. Rev Bras Enferm [Internet]. 2019 Feb [cited 2021 Sep 18];72(suppl 1):336-40. Available from: https://doi.org/10.1590/0034-7167-2017-0632

14. Ministério da Saúde (BR). Sistema de Agravos e Notificação (Sinan Net). O Sinan [Internet]. 1998 [cited 2018 Jan 17]. Available from: http://www.portalsinan.saude.gov.br/o-sinan

15. Castro SS, Scatena LM, Miranzi A, Miranzi NA, Nunes AA. Tendência temporal dos casos de HIV/aids no estado de Minas Gerais, 2007 a 2016. Epidemiol Serv Saude [Internet]. 2020 Mar 23 [cited 2020 Oct 11];29(1):e2018387. Available from: https://doi.org/10.5123/s1679-49742020000100016

16. Ribeiro LCS, Freitas MIF, Tupinambás U, Lana FCF. Late diagnosis of human immunodeficiency virus infection and associated factors. Rev Latino-Am Enfermagem [Internet]. 2020 [cited 2020 Oct 09];28:e3342. Available from: https://doi.org/10.1590/1518-8345.4072.3342

17. Sangaramoorthy T. Chronicity, crisis, and the 'end of AIDS'. Glob Public Health [Internet]. 2018 Aug [cited Nov 2019];13(8):982-96. Available from: https://doi.org/10.1080/17441692.2018.1423701

18. Waymack JR, Sundareshan V. Acquired immune deficiency syndrome (AIDS). In: StatPearls [Internet]. Treasure Island, FL(US): StatPearls Publishing; 2020. Available from: https://www.ncbi.nlm.nih.gov/books/NBK537293/

19. Challacombe SJ. Global oral inequalities in HIV infection. Oral Dis [Internet]. 2016 Apr [cited 2020 Sep 19];22(Suppl 1):35-41. Available from: https://doi.org/10.1111/odi.12408

20. Ribeiro LCS, Giami A, Freitas MIF. Representations of people living with HIV: influences on the late diagnosis of infection. Rev Esc Enferm USP [Internet]. 2019 Mar 11 [cited 2020 Feb 15];53:e03439. Available from: http://doi.org/10.1590/s1980-220x2018009703439

21. Alencar RA, Ciosak SI. O diagnóstico tardio e as vulnerabilidades dos idosos vivendo com HIV/aids. Rev Esc Enferm USP [Internet]. 2014 [cited 2020 Sep 28];49(2):229-35. Available from: https://www.scielo.br/pdf/reeusp/v49n2/pt_0080-6234-reeusp-49-02-0229.pdf

22. Rodrigues CFC, Duarte YAO, Rezende FAC, Brito TRP, Nunes DP. Atividade sexual, satisfação e qualidade de vida em pessoas idosas. Rev Eletr Enferm [Internet]. 2019 [cited 2020 Oct 20];21:57337. Available from: https://doi.org/10.5216/ree.v21.57337

23. Vieira CPB, Costa ACSS, Dias MCL, Araújo TME, Galiza FT. Tendência de infecções por HIV/Aids: aspectos da ocorrência em idosos entre 2008 e 2018. Esc Anna Nery [Internet]. 2021 [cited 2021 Aug 11];25(2):e20200051. Disponível em: https://doi.org/10.1590/2177-9465-EAN-2020-0051

24. Castejon MJ, Yamashiro R, Oliveira CAF, Mata EHA, Brígido LFM, Guimarães MDC, et al. Performance evaluation of HIV infection diagnostic tests. J Bras Patol Med Lab [Internet]. 2020 [cited 2020 Oct 22];56:e1842020. Available from: https://www.scielo.br/j/jbpml/a/kpYxJCq8FLcMFBSrQ3596Nb/?lang=en

25. Colaço AD, Meirelles BHS, Heidemann ITSB, Villarinho MV. Care for the person who lives with HIV/AIDS in primary health care. Texto Contexto Enferm [Internet]. 2019 [cited 2020 Oct 7];28:e20170339. Available from: https://doi.org/10.1590/1980-265x-tce-2017-0339

26. Aniley AB, Ayele TA, Zeleke EG, Kassa AA. Factors associated with late Human Immunodeficiency Virus (HIV) diagnosis among peoples living with it, Northwest Ethiopia: hospital based unmatched case-control study. BMC Public Health [Internet]. 2016 Oct 12 [cited 2020 Oct 13];16(1):1076. Available from: https://doi.org/10.1186/s12889-016-3727-0

27. Takahashi LM, Magalong MG, Debell P, Fasudhani A. HIV and AIDS in suburban Asian and Pacific Islander communities: factors influencing self-efficacy in HIV risk reduction. AIDS Educ Prev [Internet]. 2006 Dec [cited 2020 Sep 16];18(6):529-45. Available from: https://doi.org/10.1521/aeap.2006.18.6.529

28. Instituto Brasileiro de Geografia e Estatística (BR). Pesquisa Nacional por Amostra de Domicílios Contínua - PNAD Contínua: Tabelas Educação 2019 [Internet]. 2019 [cited 2020 Oct 22]. Available from: https://www.ibge.gov.br/estatisticas/sociais/educacao/17270-pnad-continua.html?edicao=28203&t=resultados

29. Mangili A, Murman DH, Zampini AM, Wanke CA, Mayer KH. Nutrition and HIV infection: review of weight loss and wasting in the era of highly active antiretroviral therapy from the nutrition for healthy living cohort. Clinical Infectious Diseases [Internet]. 2006 Mar 15 [cited 2021 Nov 10];42(6):836-42. Available from: https://doi.org/10.1086/500398

30. Luma HN, Jua P, Donfack O, Kamdem F, Ngouadjeu E, Mbatchou HB, et al. Late presentation to HIV/AIDS care at the Douala general hospital, Cameroon: its associated factors, and consequences. BMC Infect Dis [Internet]. 2018 Jul 3 [cited 2020 Oct 16];18(1):298. Available from: https://doi.org/10.1186/s12879-018-3204-8

31. Rocha KB, Ew RDAS, Moro LM, Zanardo GLP, Pizzinato A. Asesoramiento en la perspectiva de profesionales de la atención primaria de salud: desafíos en la descentralización de la prueba rápida VIH / SIDA. Cienc Psicol [Internet]. 2018 [cited 2021 Aug 18];12(1):67-78. Available from: https://doi.org/10.22235/cp.v12i1.1597

32. Conselho Federal de Enfermagem (COFEN). Resolução Cofen-195/1997: dispõe sobre a solicitação de exames de rotina e complementares por Enfermeiro. [Internet]. 1997 [cited 2021 Aug 18]. Available from: http://www.cofen.gov.br/resoluo-cofen-1951997_4252.html

33. Conselho Federal de Enfermagem (COFEN). Parecer de câmara técnica Nº 12/2020/CTAS/COFEN: dispõe sobre prescrição de medicamentos para profilaxia pós exposição ao HIV (PEP) e profilaxia pré exposição ao HIV (PrEP) por enfermeiros. [Internet]. 1997 [cited 2021 Aug 18]. Available from: http://www.cofen.gov.br/81126_81126.html

34. Castro SS, Scatena LM, Miranzi A, Miranzi NA, Camargo FC, Nunes AA. HIV/AIDS case definition criteria and association between sociodemographic and clinical aspects of the disease reported in the State of Minas Gerais from 2007 to 2016. Rev Soc Bras Med Trop [Internet]. 2018 Jul-Aug [cited 2020 Oct 10];51(4):427-35. Available from: https://doi.org/10.1590/0037-8682-0117-2018

35. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Guia de vigilância em saúde. Brasília (DF): Ministério da Saúde; 2019 [cited 2021 Aug 18]. Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-1087260

NOTES

ORIGIN OF THE ARTICLE

Extracted from the Scientific Initiation Project - Late diagnosis of the HIV infection in health services from Ribeirão Preto–SP: Findings from 2015 to 2017, *Escola de Enfermagem de Ribeirão Preto*, *Universidade de São Paulo*, in 2019.

CONTRIBUTION OF AUTHORITY

Study design: Antonini M, Melo ES, Reis RK.
Data collection: Antonini M.
Data analysis and interpretation: Ferreira GRON, Antonini M, Gerin L, Reis RK.
Discussion of the results: Antonini M, Gerin L, Melo ES, Arantes LMN, Reis RK.
Writing and/or critical review of the content: Antonini M, Melo ES, Reis RK, Pontes PS.
Review and final approval of the final version: Antonini M, Gerin L, Melo ES, Pontes PS, Arantes LMN, Ferreira GRON, Reis RK.

FUNDING INFORMATION

Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), *Programa Institucional de Bolsas de Iniciação Cientifica* (PIBIC). Effective period: From 08/2018 to 07/2019.

APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved in the Research Ethics Committee of the *Escola de Enfermagem de Ribeirão Preto*, *Universidade de São Paulo*, opinion No.2,701,163, Certificate of Presentation for Ethical Appreciation 11745112.7.0000.5393.

CONFLICT OF INTEREST

There is no conflict of interest.

EDITORS

Associated Editors: Gisele Cristina Manfrini, Natália Gonçalves, Ana Izabel Jatobá de Souza.
Editor-in-chief: Roberta Costa.

HISTORICAL

Received: December 14, 2020.
Approved: October 19, 2021.

CORRESPONDING AUTHOR

Marcela Antonini
antonini.enf@gmail.com