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Original Article

Factors associated with non-compliance with antiretrovirals in HIV/AIDS patients

Fatores associados à não adesão dos antirretrovirais em portadores de HIV/AIDS

Factores asociados a la no adhesión a los retrovirales de portadores de VIH/SIDA

Elielza Guerreiro Menezes[1]
Simone Rodrigues Fernandes dos Santos[1]
Giane Zupellari dos Santos Melo[1]
Gisele Torrente[1]
Arlene dos Santos Pinto[2]
Yara Nayá Lopes de Andrade Goiabeira[3]

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Abstract
Objective: To identify the factors associated to non-compliance with antiretroviral treatment in HIV / AIDS patients at a reference hospital in Manaus.
Methods: Hospital-based, quantitative, cross-sectional study developed with 100 participants with HIV / AIDS in outpatient follow-up. For the data collection, the self-administered "Questionnaire for the evaluation of compliance with antiretroviral treatment in people with HIV / AIDS" (CEAT-VIH) was used. Descriptive analysis was performed using the Pearson chi-square to obtain the p-value.
Results: Male participants were predominant (57%), age between 40 and 59 years (34%), secondary education (49%), without employment bond (84%), monthly income of one to three minimum wages (54%), unmarried (47%), heterosexual (76%), with sexual partner (56%), without active sexual life (61%), time since diagnosis between six months and five years (59%), no hospitalization (%). The predominant level of compliance was medium compliance (85%). The sociodemographic variables that revealed a statistically significant association with ARVT were sexual orientation ($p = 0.010$) and time since diagnosis ($p = 0.035$).
Conclusion: The study showed that people living with HIV comply with ARVT, but with medium compliance. The main factors associated with this result were sexual orientation and time since diagnosis.

Resumo
Objetivo: Identificar os fatores associados à não adesão ao tratamento antirretroviral em portadores de HIV/ AIDS em um Hospital de referência em Manaus.
Métodos: Estudo com abordagem quantitativa, transversal de base hospitalar, desenvolvido com 100 participantes com HIV/AIDS em acompanhamento ambulatorial. Para a coleta de dados foi utilizado o questionário autoaplicável, denominado "Questionário para a avaliação da adesão ao tratamento antirretroviral em pessoas com HIV/AIDS" (CEAT–VIH). Foi realizada análise descritiva, empregado o teste de qui-quadrado de *Pearson chi-square* para o valor de p.
Resultados: Predominou o sexo masculino (57%), faixa etária entre 40 a 59 anos (34%) escolaridade de 2º Grau (49%), sem vínculo empregatício (84%), renda mensal de 1 a 3 salários mínimos (54%), solteiros (47%), heterossexuais (76%), com parceiro sexual (56%), sem vida sexual ativa (61%), tempo de diagnóstico entre 6 meses a 5 anos (59%), nenhuma internação hospitalar (59%). O nível de adesão predominante foi a média adesão (85%). As variáveis sociodemográficas que tiveram associação estatisticamente significantes com a adesão TARV foram a orientação sexual (p=0,010) e o tempo de diagnóstico (p=0,035).
Conclusão: O estudo mostrou que pessoas que convivem com HIV aderem a TARV, porém com média adesão e os principais fatores associados a esse resultado foram a orientação sexual e o tempo de diagnóstico.

Resumen
Objetivo: Identificar los factores asociados a la no adhesión al tratamiento antirretroviral en portadores de VIH/SIDA en Hospital de referencia de Manaus.
Métodos: Estudio con abordaje cuantitativo, transversal, de base hospitalaria, desarrollado con 100 participantes con VIH/SIDA en seguimiento ambulatorio. Datos recolectados mediante cuestionario autoaplicable, denominado "Cuestionario para evaluación de la adhesión al tratamiento antirretroviral en personas con VIH/SIDA" (CEAT-VIH). Se realizó análisis descriptivo, utilizando el test de Chi-cuadrado de Pearson *Chi-square* para el valor de p.
Resultados: Predominio de sexo masculino (57%), faja etaria de 40 a 59 años (34%), educación secundaria (49%), sin trabajo fijo (84%), ingresos mensuales de 1 a 3 salarios mínimos (54%), solteros (47%), heterosexuales (76%), con pareja sexual (56%), sin vida sexual activa (61%), tiempo de diagnóstico de 6 meses a 5 años (59%), sin internaciones hospitalarias (59%). El nivel de adhesión predominante fue la mediana adhesión (85%). Las variables sociodemográficas con asociación estadísticamente significativa con la adhesión al TARV fueron la orientación sexual (p=0,010) y el tiempo de diagnóstico (p=0,035).
Conclusión: El estudio mostró que las personas que conviven con VIH adhieren al TARV, aunque con mediana adhesión, y los principales factores asociados a tal resultado fueron la orientación sexual y el tiempo de diagnóstico.

Corresponding author
Elielza Guerreiro Menezes
http://orcid.org/0000-0003-1804-6384
E-mail: egmenezes@uea.edu.br

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[1]Universidade do Estado do Amazonas, Manaus, AM, Brazil.
[2]Fundação de Medicina Tropical Dr. Heitor Vieira Dourado, Manaus, AM, Brazil.
[3]Universidade Federal do Maranhão, São Luís, MA, Brazil.

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Introduction

First described in 1981, the Human Immunodeficiency Syndrome went through several demographic and epidemiological changes.[1]

With the discovery of new drugs in recent years, advances have been achieved in the fight against HIV. This fact had an impact on the prognosis and epidemiology of the disease, causing a significant decrease in morbidity and mortality in people living with the virus in Brazil and around the world, but these drugs present new challenges to understand and cope with this disease.[2,3]

Despite these changes in the HIV / AIDS profile, the number of HIV-positive people is still high. According to UNAIDS - Joint United Nations Program on HIV / AIDS, controlling the disease will only be possible when all those infected are being treated. Therefore, the goal "90-90-90" was established, which aims to ensure that all infected people are treated by 2020, that 90% of people living with HIV know they have the virus, 90% receive ARVT - Antiretroviral Therapy and 90% of these have viral suppression.[4]

Treatment compliance being one of the greatest challenges in care for people living with HIV, it is one of the key pieces to reduce future complications and to improve and prolong the quality of life of individuals affected by the virus. The correct use of the antiretrovirals generates a reduction of costs with future hospitalizations due to complications of the infection, as well as of the necessity to exchange the drug for other more complex and expensive medicines.[5]

In order to achieve good rehabilitation and stability of the patient affected by HIV / AIDS, good treatment compliance is fundamental. In this sense, a universal treatment access policy is put in practice with studies on the identification of factors that lead to the interruption of drug therapy, being highly relevant for a better understanding of the problem and for the appropriate performance of health professionals, favoring a higher quality and life expectancy for these people.[6]

In this context, the objective of this study was to identify factors associated to non-compliance with antiretroviral treatment in HIV / AIDS patients at a reference hospital in Manaus.

Methods

This is a quantitative, cross-sectional, hospital-based study conducted at the Outpatient Clinic of the Foundation for Tropical Medicine Dr. Heitor Vieira Dourado. Data collection took place from October 2017 to January 2018. Participants were included in the study during the routine outpatient visit. The interviews were conducted inside the doctor's office, permitting the secrecy and confidentiality of the information obtained.

The sample was consecutive and non-probabilistic, in accordance with the inclusion criteria: male and female patients, aged 18 years or older; patients diagnosed with HIV for more than six months; being registered in the institution's UDM-Medication Dispensation Unit; being on antiretroviral therapy for at least six months in the I Doctor system. According to these criteria, 100 participants were included in the study.

The self-administered "Questionnaire for the evaluation of compliance with antiretroviral treatment in people with HIV / AIDS" (CEAT/VIH) was used to collect the data, which was validated for the Brazilian version by Remor, Milner-Moskovics and Preussler.[7] This questionnaire was used to assess the compliance level to antiretroviral treatment. It is multidimensional, covering the main factors that can modulate the treatment compliance behavior.[7] Consisting of 20 questions, CEAT-VIH evaluates the patients' compliance level to ARVT at three levels: low (d" 52 points or <50%); medium (53 to 78 points or 50 to 84%); and high (e" 79 points or> 85%). The minimum score is 17 and the maximum is 89. The higher the score, the higher the treatment compliance level.[7]

The sociodemographic data related to the patients were obtained through the application of a semistructured questionnaire, prepared by the researcher.

The collected data were organized and systemized in an Excel® spreadsheet and analyzed

in Statistical Package for Social Sciences (SPSS), version 2.0.

Descriptive statistics were used for sociodemographic characterization and descriptions of the domain scores. The variables were expressed in absolute and relative frequencies, independent of the measuring level. For the analysis, chi-square tests were performed, inferential analyses with $p < 0.05$ being considered statistically significant.

The development of the study met Brazilian standards of ethics for research involving human subjects and obtained approval from the research ethics committee under CAEE 74054217.4.0000.5016.

Results

In this study, 100 participants answered the questionnaire regarding the sociodemographic data and compliance with ARVT. First, the variables related to the sociodemographic aspects were analyzed, in which the male sex predominated (57%). The predominant age group was between 40 and 59 years old (34%), with secondary education (49%). With regard to employment status, 84% reported being unemployed, with monthly income of one to three minimum wages (54%). The majority of them reported being self-employed, single (47%). The predominant sexual orientation was heterosexual (76%), with a sexual partner (56%), no active sex life (61%), time since diagnosis between six months and five years (59%). The predominant hospitalization was none (59%) during the antiretroviral treatment of HIV patients attended during the study (Table 1).

Among the 100 interviewees, 85% were classified as medium compliance, 13% as high and only 2% as low compliance according to their answers and the total CEAT/HIV score. The minimum score in the study was 47 and the maximum 82, with an average score of 70.63 and a standard deviation of 7.67 (Table 2).

A statistically significant association was observed between two sociodemographic variables and the compliance levels with ARVT: sexual orientation (p=0.010) and time since diagnosis (p=0.035).

Table 1. Distribution of sociodemographic data of the 100 participants in the study population

Variables	n(%)
Sex	
Male	57(57.0)
Female	43(43.0)
Age Range	
18 to 29 years	10(10.0)
30 to 39 years	28(28.0)
40 to 59 years	34(34.0)
50 to 59 years	14(14.0)
>60 years	14(14.0)
Education	
Illiterate	2(2.0)
Primary	35(35.0)
Secondary	49(49.0)
Higher	14(14.0)
Employment	
Yes	16(16.0)
No	84(84.0)
Monthly income	
< 1 minimum wage	42(42.0)
1 to 3 minimum wages	54(54.0)
3 to 5 minimum wages	3(3.0)
> 5 minimum wages	1(1.0)
Marital Status	
Single	47(47.0)
Married	11(11.0)
Living with Fixed Partner	33(33.0)
Separated	4(4.0)
Divorced	1(1.0)
Widowed	4(4.0)
Sexual orientation	
Homosexual	18(18.0)
Bisexual	6(6.0)
Heterosexual	76(76.0)
Has a sexual partner	
Yes	56(56.0)
No	44(44.0)
Active sexual life	
Yes	39(39.0)
No	61(61.0)
Time since diagnosis	
6 months to 5 years	59(59.0)
6 years to 10 years	28(28.0)
11 to 15 years	7(7.0)
16 to 20 years	6(6.0)
Hospitalization antecedents	
None	59(59.0)
1 to 3 times	35(35.0)
3 to 5 times	2(2.0)
> 5 times	4(4.0)

Table 2. Classification of antiretroviral treatment compliance data

Compliance levels*	n(%)
Low	2(2.0)
Medium	85(85.0)
High	13(13.0)

*Levels defined according to classification of compliance with antiretroviral therapy of the version of the "cuestionario para la Evaluación de la Adhesión al tratamiento antirretroviral – CEAT/HIV" validated for Brazilian Portuguese

Table 3. Distribution of sociodemographic data and Compliance Level with Antiretroviral Therapy

Variables	High compliance n(%)	Medium compliance n(%)	Low compliance n(%)	Total n(%)	p-value*
Sex					
Male	9(16)	46(80)	2(4)	57(100)	0.274
Female	4(9)	39(91)	0(0)	43(100)	
Age Range					
18 to 29 years	1(10)	9(90)	0(0)	10(100)	0.438
30 to 39 years	3(11)	23(82)	2(7)	28(100)	
40 to 59 years	7(20)	27(80)	0(0)	34(100)	
50 to 59 years	1(7)	13(93)	0(0)	14(100)	
>60 years	1(7)	13(93)	0(0)	14(100)	
Education					
Illiterate	0(0)	2(100)	0(0)	2(100)	0.622
Primary	3(9)	31(88)	1(3)	35(100)	
Secondary	8(16)	41(84)	0(0)	49(100)	
Higher	2(14)	11(79)	1(7)	14(100)	
Employment					
Yes	2(12)	14(88)	0(0)	16(100)	0.819
No	11(13)	71(85)	2(2)	84(100)	
Monthly income					
< 1 minimum wage	2(5)	39(93)	1(2)	42(100)	0.443
1 to 3 minimum wages	11(20)	42(78)	1(2)	54(100)	
3 to 5 minimum wages	0(0)	3(100)	0(0)	3(100)	
> 5 minimum wages	0(0)	1(100)	0(0)	1(100)	
Marital Status					
Single	7(15)	39(83)	1(2)	47(100)	0.735
Married	1(9)	10(11.8)	0(0)	11(100)	
Living with Fixed Partner	3(9)	29(88)	1(3)	33(100)	
Separated	0(0)	4(100)	0(0)	4(100)	
Divorced	0(0)	1(100)	0(00	1(100)	
Widowed	2(50)	2(50)	0(0)	4(100)	
Sexual orientation					
Homosexual	6(33)	11(61)	1(6)	18(100)	0.010
Bisexual	2(33)	4(67)	0(0)	6(100)	
Heterosexual	5(6)	70(92)	1(2)	76(100)	
Has a sexual partner					
Yes	6(46.2)	49(57.6)	1(50.0)	56(100)	0.728
No	7(53.8)	36(42.4)	1(50.0)	44(100)	
Active sexual life					
Yes	6(15)	32(82)	1(3)	39(100)	0.800
No	7(11)	53(87)	1(2)	61(100)	
Time since diagnosis					
6 months to 5 years	6(10)	52(88)	1(2)	59(100)	0.035
6 years to 10 years	3(11)	25(89)	0(0)	28(100)	
11 to 15 years	3(43)	4(57)	0(0)	7(100)	
16 to 20 years	1(17)	4(66)	1(17)	6(100)	
Hospitalization antecedents					
None	6(10)	52(88)	1(2)	59(100)	0.781
1 to 3 times	7(20)	27(77)	1(3)	35(100)	
3 to 5 times	0(0)	2(100)	0(0)	2(100)	
> 5 times	0(0)	4(100)	0(0)	4(100)	

*_p-values_ calculated by means of Pearson's chi-square test, comparing the compliance level with each variable

When the variables sex, age range, education, employment, monthly income, sexual partner, active sexual life and hospitalization antecedents were considered, no statistically significant association was observed (Table 3).

Discussion

The precariousness of research on this topic in the North of Brazil is noted, where the mortality due to AIDS showed the highest growth rate in the past 10 years.[8]

The participants' sociodemographic characteristics confirm the profile of seropositive individuals in Brazil, with a predominance of males, between 40 and 59 years of age, secondary education level (high school), monthly income between one and three minimum wages, single and heterosexual, with sexual partner, but without active sex life.

Studies conducted in other regions indicated that 60% of infected individuals were male and 58.7% were between 40 and 59 years old.[9] Studies conducted outside Brazil found that female individuals were predominant though.[10]

In another study, results similar to the present study were found, with a predominance of secondary education and monthly income between 1 and 3 minimum wages.[11]

Studies show that, the higher the level of education, the better the people's perception, as well as the access to information about HIV / AIDS.[3] In this sense, the expected result regarding the education level was lower than that obtained, as in some studies where low education prevailed.[1] As noticed, the result of this study proves how the HIV profile in Brazil has been changing over time.

The results of this study corroborate those of other authors, where single individuals prevailed.[12] Studies have shown that single people have a lower chance of using condoms than married couples.[4] This may influence the increase of infection and transmission risks. They are more promiscuous and less careful about their health because they have to take care of themselves alone.[14]

In 2016, HIV / AIDS infection was predominant among heterosexuals in almost all regions of Brazil, except for the Southeast, where the infection was predominant among homosexuals.[15] These data further affirm the change in the profile of HIV / AIDS, which in the early phase of the disease prevailed among homosexuals.[12]

With regard to the employment bond, we can note some studies with results different from those found in this study, with a prevalence of people living with the virus and being formally employed.[9]

It is observed that most had sexual partners but did not have an active sexual life. Some participants reported having lost sexual pleasure after discovering the virus. In a study conducted in another region, people living with HIV reported restricting or suppressing their sexual practices because they had to reveal their HIV-positive status and were afraid of transmitting the disease, but they kept their sex life active,[16] which did not occur with the participants of this study, as sexual inactivity prevailed.

Regarding the time since diagnosis from six months to five years, our results differed from studies conducted in other regions, where the patients had been living with HIV ≥ 10 years.[9] Few studies are related to the time since diagnosis though, as most of them study the treatment time.

Regarding the hospitalization history, the results showed that no hospitalization prevailed in the study participants. No studies were found in the literature regarding this variable.

There were limitations in this study due to the short time of data collection. Because the data collection was performed in only one clinic and in a state with a high number of seropositives, the study population is considered small.

This study offers an important contribution in presenting the factors associated with non-compliance to ARVT and in measuring the level of compliance of seropositive individuals, making it possible to outline strategies to decrease these factors and to improve compliance with drug therapy.

Concerning the level of compliance with ARVT in the participants with a prevalence of medium compliance, similar results were also found using the same CEAT-HIV assessment tool, which is considered the most specific to assess the compliance level, despite its limitations.[17]

This result is worrisome as virologic failure can occur, making the viral load detectable during the treatment, representing a barrier to the success of the therapy, which can entail risks of disease progression, viral resistance and, consequently, the reduction of future therapies.[11]

For the sake of effective therapy, the patient needs to consume at least 95% of the prescribed medications, in order to keep the viral load undetectable and be able to reasonably reduce the possibility of virus transmission. Thus, the effectiveness of the ARVT depends on the compliance.[8]

On the other hand, other studies carried out in other parts of Brazil showed quite different results, where high compliance levels prevailed. This can be explained by lifestyle variation, access to quality treatment and early diagnosis.[9]

Because AIDS is classified as a chronic disease, we cannot judge this level of compliance as definitive because it can vary at any time during therapy. Therefore, it is important for health professionals to encourage compliance.[11]

Among the variables studied, those associated with ARVT compliance are sexual orientation, where studies with similar results were found in which sexual orientation was statistically significant.[18]

The other variable that presented statistical significance was the time since diagnosis. Some studies argue that, the longer the diagnosis, the better the compliance,[9] but the result of this study did not prove this, in view of variations in the results.

Conclusion

The study showed that people with HIV complied with antiretroviral therapy, but with medium compliance, and the main factors associated with this result were sexual orientation and time since diagnosis. This result is worrying, which may be related to the increase in the transmissibility of the disease and the increase in the number of HIV cases in the state of Amazonas. In this sense, it suggests the follow-up of ARVT compliance in people living with

the virus. Assuming that compliance is a continuous process involving not only the seropositive individuals, but also the family and health professionals, the active search of people who dropped out of the treatment is of utmost importance because they did not even enter the research as they were not monitored at the place of study.

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Collaborations

Menezes EG contributed to the project design and to the analysis and interpretation of the data. Santos SRF contributed to the project design and to the analysis and interpretation of the data. Melo GZS contributed to the relevant critical review of the intellectual content. Torrente G collaborated with the relevant critical review of the intellectual content. Pinto AS collaborated with the data collection and execution of the research. Andrade YNL cooperated with the writing of the article and with the relevant critical review of the intellectual content. Both approved the final version for publication.

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