People living with HIV/AIDS in prison: regular use of antiretroviral therapy

Pessoas vivendo com HIV/Aids no cárcere: regularidade no uso da terapia antirretroviral

Personas que viven con el VIH/sida en la cárcel: regularidad del uso del tratamiento antirretroviral

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Abstract
Objective: To analyze the challenges related to regularity in the use of antiretroviral therapy by people living with HIV deprived of their liberty.
Methods: This is an exploratory study, with a quantitative approach, carried out in six prison units of two municipalities in São Paulo State. The data collection took place in the period from August to November 2015, through interviews, with the support of a specific tool. Data were analyzed using descriptive techniques, univariate analysis (Chi-Square association test and Fisher's Exact Test) and non-parametric Mann-Whitney U test.
Results: 67 individuals taking antiretroviral therapy participated in the study. It was identified that, in the last seven days, 80.6% of the subjects did not stop taking the antiretroviral drugs and 91% denied taking the wrong amount of tablets, according to the medical prescription. Regarding the antiretroviral therapy monitoring actions, questioning about continuous use of the drugs by the health team of the prison units was considered regular. Irregular use of antiretroviral therapy showed a statistically significant association with use of licit drugs prior to incarceration ($p = 0.006$) and interruption of medical follow-up ($p = 0.014$).
Conclusion: These findings show the need for intervention strategies that favor follow-up and monitoring of the use of antiretroviral therapy in the prison context.

Resumo
Objetivo: Analisar os desafios relacionados à regularidade no uso da terapia antirretroviral pelas pessoas vivendo com HIV privadas de liberdade.
Métodos: Trata-se de um estudo exploratório, com abordagem quantitativa, realizado em seis unidades prisionais de dois municípios paulistas. A coleta de dados ocorreu no período de agosto a novembro de 2015, mediante entrevistas, com apoio de instrumento específico. Os dados foram analisados a partir de técnicas descritivas, análise univariada (testes de associação Qui-quadrado e Exato de Fisher) e teste não paramétrico U de Mann-Whitney.
Resultados: Participaram da pesquisa 67 indivíduos em uso da terapia antirretroviral. Identificou-se que, nos últimos sete dias, 80,6% dos indivíduos não deixaram de tomar os medicamentos antirretrovirais e 91% negaram tomar quantidade errada de comprimidos, de acordo com a prescrição médica. Quanto às ações de monitoramento da terapia antirretroviral, o questionamento sobre o uso contínuo dos medicamentos pela equipe de saúde das unidades prisionais foi considerado regular. O uso irregular da terapia antirretroviral apresentou associação estatisticamente significante com uso de drogas lícitas antes do encarceramento ($p=0,006$) e interrupção do acompanhamento médico ($p=0,014$).
Conclusão: Tais achados mostram a necessidade de estratégias de intervenção que favoreçam o acompanhamento e monitoramento do uso da terapia antirretroviral no contexto prisional.

Resumen
Objetivo: analizar los desafíos relacionados con la regularidad del uso del tratamiento antirretroviral por personas privadas de la libertad que viven con el VIH.
Métodos: se trata de un estudio exploratorio, con enfoque cuantitativo, realizado en seis unidades penitenciarias de dos municipios del estado de São Paulo. La recolección de datos se llevó a cabo en el período de agosto a noviembre de 2015 mediante entrevistas, con apoyo de instrumento específico. Los datos fueron analizados a partir de técnicas descriptivas, análisis univariado (prueba ^{2} de Pearson y prueba exacta de Fisher) y prueba no paramétrica U de Mann-Whitney.
Resultados: participaron de la investigación 67 individuos en tratamiento antirretroviral. Se identificó que, en los últimos siete días, el 80,6% de los individuos no dejó de tomar los medicamentos antirretrovirales y un 91% negó haber tomado la cantidad equivocada de comprimidos, de acuerdo con la prescripción médica. Con relación a las acciones de monitoreo del tratamiento antirretroviral, el cuestionamiento sobre el uso continuo de los medicamentos por el equipo de salud de las unidades penitenciarias fue considerado regular. El tratamiento antirretroviral irregular presentó una relación estadísticamente significativa con el uso de drogas lícitas antes del encarcelamiento ($p=0,006$) y la interrupción del seguimiento médico ($p=0,014$).
Conclusión: tales descubrimientos demuestran la necesidad de estrategias de intervención que favorezcan el seguimiento y monitoreo del uso del tratamiento antirretroviral en el contexto penitenciario.

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Introduction

The AIDS epidemic has changed in 1996, with the advent of antiretroviral therapy (ART), resulting in a new profile of the disease that has become a chronic condition and has made the goals set by the Joint United Nations Program on HIV/AIDS (UNAIDS) by the end of the epidemic, globally, by 2030. These targets involve identifying 90% of people living with the virus, treating 90% of cases diagnosed with HIV, and achieving viral suppression in 90% of people taking antirretroviral drugs.[1]

For the operationalization of international goals, the epidemiological model called the continuous care cascade has been used, which is anchored in the programmatic monitoring of the epidemic and aims at the early diagnosis, linkage and retention of people living with HIV/AIDS (PLWHA) to services health, assuming the offer of ART and viral suppression.[2]

Thus, it is essential to develop strategies aimed at accessing and adhering to ART to reach the end of the HIV epidemic in the world, where about 1.8 million diagnoses of HIV infection were made in 2016, making up an estimate of 36.7 million people living with HIV.[3] These are concentrated in developing countries and in key populations, denoting segments with greater vulnerability to infection and illness.[4]

In relation to the epidemic in Brazil, 984,129 cases of AIDS have been reported since the beginning of the registration of cases until June 2018.[4] However, although the prevalence of HIV in the Brazilian general population has remained stable at 0.6% since 2004, the epidemic is concentrated in key populations whose prevalence can reach 10.5%.[5]

Among the key populations, prison population stands out that is more likely to contract HIV because of the risk behaviors experienced within the prison.[6] In addition, it is important to emphasize that the prevalence of infection in the prison environment is higher when compared to the general population.[7,8]

Brazil currently has the third largest prison population in the world, with 726,215 prisoners.[9] The scenario of unhealthy and overcrowded Brazilian prisons and the sociodemographic profile of incarcerated people focus on determining factors for increasing vulnerability to HIV in prisons and elements that constitute barriers to treatment adherence, such as the lack of autonomy and privacy in the use of ART.[10]

However, incarceration can have a positive impact on the clinical condition of those living with HIV because it provides opportunities for continuity of care, linkage with health services, and access to ART.[11] This aspect deserves to be investigated in the Brazilian scenario, since the *Política Nacional de Atenção Integral à Saúde das Pessoas Privadas de Liberdade* (PNAISP – freely translated as National Policy of Comprehensive Care for the Health of Persons Deprived of Liberty) recommends that prison health teams be considered as primary health care points, with the prison population having the right access to health services and actions offered by SUS.

Given this scenario, addressing the use of ART and the strategies adopted in the prison context to guarantee adherence to treatment becomes extremely important and can support reflections and proposition of strategies that optimize and qualify the production of health care, as well as the adequate management of HIV in this population.

Thus, this study aimed to analyze the regularity of PLWHA use of ART in the prison context, adopting as a theoretical framework the Chronic Conditions Care Model (MACC – *Modelo de Atenção às Condições Crônicas*) proposed by Mendes.[12] This model is used to identify the demands and to organize health care, based on the population stratification according to their vulnerabilities, social determinants and the relation between users and health professionals, in such a way that the proposed health interventions go through the promotion and prevention to health care management to case management.[12]

Methods

This is an exploratory study, with a quantitative approach, carried out in six prison units located in the

countryside of São Paulo State, one female prison unit, three male and two male Provisional Detention Centers. These units were included in the study because they belong to a region with the third highest incidence of HIV in the state.[13] It should be noted that, in general, a temporary detention center differs from a penitentiary because it houses prisoners without conviction, who are awaiting trial.

The population of this study was composed of individuals diagnosed with HIV/AIDS and had as inclusion criteria to be in ART and to be deprived of liberty for more than six months in the prison study unit. This period was defined as it was intended to obtain information on the experience of individuals receiving treatment in the prison context, estimating that in this period the person had attended at least one appointment with an infectious disease and with the doctor of the prison health unit and is receiving antiretroviral medications according to the routine of the service. There were 102 inmates diagnosed for HIV in PU, of whom 10 were in PU for less than six months, two were not in PU at the time of the interview and five subjects did not want to participate in the study. In addition, 18 did not use ART, such that 67 subjects were included in this study.

Primary data were collected through interviews, with the support of a tool structured in sections: I. regularity in the use of ART; II. sociodemographic and clinical data; III. follow-up and monitoring of the use of antiretroviral therapy by ART. In the questions in section I of the instrument, the answers were given by means of dichotomous variables. The variables of section II included options of dichotomous, multiple choice and quantitative answers. In section II, the answers were given from a pre-established scale (Likert scale) with a value between "one" and "five", whose less favorable answer corresponded to "one" and more favorable to "five". A visual scale of responses (Likert) was made available to facilitate participants' understanding during the interview.

Secondary data were also collected through the Prison Health Records, *Sistema de Controle Logístico de Medicamento* (SICLOM - Medicinal Product Logistic Control System) to obtain data on the withdrawal of antiretroviral drugs and the Laboratory Testing System of the National CD4 + Lymphocyte Count Network/CD8 + and HIV Viral Load (SISCEL - *Sistema de Controle de Exames Laboratoriais*), this being to acquire the results of laboratory tests performed in the year prior to the date of data collection.

Data collection was carried out by six members of the *Grupo de Estudos Operacionais em HIV/aids* (GEOHaids - Operational Studies on HIV/AIDS Group), and all those involved were properly trained to apply the tools, as well as to conduct the collection by ensuring reliability in the data, confidentiality, the confidentiality and protection of the identity of the study subjects. The interviews lasted on average 20 minutes and were held in reserved rooms with the presence of a penitentiary agent to safeguard the interviewers' safety.

The data collected were doubly typed and the statistical procedures used in this research were based on descriptive statistical techniques (frequency distribution, measures of central tendency and variability). In addition, indicators were developed to evaluate the frequency of actions taken to monitor the use of ART by health professionals in the prison system. The indicator corresponded to the mean value of all the responses of each variable, being classified as unsatisfactory (between 1.0 and 2.5), regular (greater than 2.5 and less than 3.5) and satisfactory (between 3.5 and 5.0). These intervals were set according to the values defined for each category of response used in the items addressed in the interviews, in such a way that the values of the positive and negative responses were grouped. Finally, univariate analysis (Chi-Square Test and/or Fisher's exact test) was used to test the association between the regularity of the use of ART and the sociodemographic and clinical profile of the cases. The non-parametric Mann-Whitney U test was used to test the difference in the performance of the prison units in relation to the monitoring of the use of ART according to the frequency of (Likert) use. For all statistical tests, a significance level of 5% was adopted.

The present study was approved by the Ethics Committee in Research with Human Beings of the institution responsible for the study, under Protocol nº CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration): 64358117.7.0000.5393.

Results

Of the 67 study participants, the majority (80.6%) were in the closed regimen and 38.8% reported being stuck between two and five years. As for the length of stay in the current prison, 38.8% had between one and three years of peison.

Regarding the regularity of the use of ART in the last seven days, most participants (76.1%) stated that they did not take the medication after normal hours, 80.6% had not stopped taking their medications and 91% tablets less than or greater than prescribed. It is noteworthy that 58.2% of ART withdrawals in the last year (2014) occurred on a regular basis with the dispensing units in the local health network (Table 1). From these results, we identified 46 individuals in regular use of ART and 21 in irregular use.

Table 1. Distribution of frequency of regularity in the use of antiretroviral therapy for persons living with HIV/AIDS deprived of their liberty in prisons in the countryside of São Paulo State

Regularity in the use of Antiretroviral Therapy		PLWHA (n=67) n(%)
Took any medication during the last seven days	Yes	14(20.9)
	No	51(76.1)
	I do not know/do not remember	2(3.0)
Stopped taking any medicine in the last seven days	Yes	12(17.9)
	No	54(80.6)
	I do not know/do not remember	1(1.5)
Took fewer or more antiretroviral therapy pills in the past seven days	Yes	4(6.0)
	No	61(91.0)
	I do not know/do not remember	2(3.0)
Withdrawal of medication in the last year registered in SICLOM	Total	39(58.2)
	Partial	23(34.3)
	Null	4(6.0)
	No information	1(1.5)

SICLOM – *Sistema de Controle Logístico de Medicamentos*

As to the sociodemographic profile, the majority were male (79.1%), young adults (52.2% between 25 and 39 years of age), non-white (64.2% self-reported black or brown), singles, (47.8%), with a low level of schooling (67.1% had between I and II), with income prior to the incarceration of one to three minimum wages (50.7%) (Table 2).

Regarding the diagnosis for HIV, 44.8% reported having been performed in the prison context. Regarding the time of knowledge of HIV serostatus, 47.8% knew it for 10 years or more and 86.6% were under medical follow-up, 47.8% of whom did so for nine years or more. However, 41.7% of the participants stated that they had stopped medical follow-up at some point in their lives. Regarding the clinical profile, 31.3% had a CD4 + T lymphocyte count above 500 copies/mm^3 and 62.7% had an undetectable viral load (<40 copies/ml). Regarding other health problems, 70.1% reported the concomitance of some other health condition, with 41.7% using other drugs besides ART. Regarding the history of pre-incarceration, 71.6% reported using illicit drugs and 80% of licit drugs (alcohol and tobacco) (Table 2).

Regular use of ART was associated with a statistically significant association with women (p = 0.024), and irregular use was associated with discontinuation of medical follow-up and history of use of licit drugs prior to incarceration (p = 0.014 and 0.004, respectively) (Table 2).

Prison units were evaluated satisfactorily for the non-delayed delivery of ART drugs. Regarding the actions developed by prison health professionals to follow up and monitor the use of ART, the loss of consultation with an infectious agent due to problems in the prison unit and the questioning about the regularity of medication intake were evaluated as regular. The following variables were considered unsatisfactory: receiving information on the results of CD4 + tests and viral load; questioning the storage conditions of the medicines in the cell; the way ART is taken; side effects of ART; difficulties in taking medicines; supervision of ART taking; collection of empty packaging. A statistically significant difference was found between the means related to the indicator "receives the drugs with delay", so that the delay occurred more frequently in the group characterized by the irregular use of the ART (Table 3).

Table 2. Sociodemographic and clinical characteristics of people living with HIV/AIDS in prisons in the countryside of São Paulo State in 2015, according to the regular use of antiretroviral therapy

Sociodemographic and clinical data of cases			Total	ART Use		*P value*
			n(%)	Regular n(%)	Irregular n(%)	
Sex	Male		53(79.1)	33(71.1)	20(95.2)	**0.024**†
	Female		14(20.9)	13(28.3)	1(4.8)	
Age	25 - 39 years		35(52.2)	23(50.0)	12(57.1)	0.587#
	40 - 61 years		32(47.8)	23(50.0)	9(42.9)	
Skin Color	White		24(35.8)	19(41.3)	5(23.8)	0.166#
	Not White		43(64.2)	27(58.7)	16(76.2)	
Marital status	Not married		32(47.8)	19(41.3)	13(61.9)	0.184#
	Married/Unemployed		23(34.3)	19(41.3)	4(19.05)	
	Separated/Divorced/ Widowed		12(17.9)	8(17.4)	4(19.05)	
Schooling	Elementary School		20(29.8)	4(8.7)	1(4.8)	0.751#
	Middle schoo		25(37.3)	14(30.4)	6(28.6)	
	High school/Higher Education		17(25.4)	18(39.1)	7(33.3)	
	No study		5(7.5)	10(21.7)	7(33.3)	
Profession	Yes		59(88.1)	41(89.1)	18(85.7)	0.486†
	No		8(11.9)	5(10.9)	3(14.3)	
Works in the penitentiary	Yes		23(34.3)	16(34.8)	7(33.3)	0.908#
	No		44(65.7)	30(65.2)	14(66.7)	
Income*	Up to 01 minimum wage		18(26.9)	11(26.8)	7(38.6)	0.215#
	01 - 03 minimum wages		34(50.7)	25(61.0)	9(50.0)	
	03 - 05 minimum wages		4(6.0)	4(9.8)	-	
	05 minimum wages or more		3(4.5)	1(2.4)	2(11.1)	
	No information		8(11.9)	-	-	
Diagnosis in the prison system	Yes		30(44.8)	19(41.3)	11(52.4)	0.398#
	No		37(55.2)	27(58.7)	10(47.6)	
Diagnostic time	Up to 5 over		18(26.8)	12(26.1)	6(28.69)	0.498#
	6 to 10 over		17(25.4)	10(21.7)	7(33.3)	
	10 or over		32(47.8)	24(52.2)	8(38.1)	
Medical monitoring	Yes		64(95.5)	41(89.1)	17(80.9)	0.292†
	No		3(4.5)	5(10.9)	4(19.1)	
Medical follow-up time	Do not do		9(13.4)	5(10.9)	4(19.0)	0.485#
	Up to 8 years		26(38.8)	17(37.0)	9(48.9)	
	9 years and over		32(47.8)	24(52.2)	8(38.1)	
Discontinuation of medical follow-up	Yes		28(41.8)	15(32.6)	13(65.0)	**0.014#**
	No		38(56.7)	31(67.4)	7(35.0)	
	Did not answer		1(1.5)	-	-	
Result of counting	<350 copies		20(29.9)	11(28.2)	9(47.4)	0.202#
	350-500 copies		17(25.4)	11(28.2)	6(31.6)	
	> 500 copies		21(31.3)	17(43.6)	4(21.0)	
	No information		9(13.4)	-	-	
Viral Load Result	Undetectable		42(62.7)	27(64.3)	15(75.0)	0.399#
	Detectable		20(29.8)	15(35.7)	5(25.0)	
	No information		5(7.5)	-	-	
Other health problems	Yes		47(70.1)	32(69.6)	15(71.4)	0.877#
	No		20(29.9)	14(30.4)	6(28.6)	
Other Medication Treatment	Yes		28(41.8)	19(41.3)	9(42.9)	0.905#
	No		39(58.2)	27(58.7)	12(57.1)	
Use of drugs	Illicit	Yes	48(71.6)	31(67.4)	17(80.9)	0.253#
		No	19(28.6)	15(32.6)	4(19.1)	
	Licit	Yes	54(80.6)	33(71.7)	21(100)	**0.004**†
		Not	13(19.4)	13(28.3)	-	

* Reference value R$ 788.00 minimum salary of 2015; † P-value for Fisher's exact test; #P value for Chi-Square Test; Bold information means value less than 0.05.

Table 3. Indicators of follow-up and monitoring of the use of antiretroviral therapy for people living with HIV/AIDS in the prison units of a municipality in the countryside of São Paulo State, according to the regularity in the use of antiretroviral therapy

Follow-up and monitoring of the use of antiretroviral therapy	Total $\bar{x}$ (±*dp*)	ART Use		P value
		Regular $\bar{x}$ (±*dp*)	Irregular $\bar{x}$ (±*dp*)	
Received medications late*	3.94 (±1.50)	4.29 (±1.14)	3.19 (±1.89)	**0.038**
Missed consultation with infectologist due to service problems*	3.15 (±1.75)	3.26 (±1.68)	2.90 (±1.92)	0.498
Received CD4 + results and viral load	1.78 (±1.56)	1.78 (±1.55)	1.76 (±1.61)	0.909
Professionals questioned the regularity in the use of antiretroviral therapy	2.88 (±1.88)	3.11 (±1.91)	2.38 (±1.75)	0.133
Questioned the occurrence of side effects of antiretroviral therapy	1.93 (±1.51)	2.07 (±1.55)	1.62 (±1.40)	0.203
Questioned difficulties in taking antiretroviral therapy	1.84 (±1.42)	2.04 (±1.55)	1.38 (±0.97)	0.077
Observed intake of antiretroviral therapy	1.07 (±0.47)	1.02 (±0.15)	1.19 (±0.81)	0.657
Requested empty packaging for antiretroviral therapy	1.06 (±0.42)	1.07 (±0.44)	1.05 (±0.38)	0.705
Questioned how you are taking antiretroviral therapy	2.03 (±1.50)	2.26 (±1.65)	1.52 (±0.93)	0.143
Questioned how antiretroviral therapy is stored	1.12 (±0.62)	1.17 (±0.71)	1.00 (±0.32)	0.358

$\bar{x}$ - mean; SD- standard deviation; ART - antiretroviral therapy
#P value for the Mann Whitney test; Bold information means value less than 0.05.
*Inverted response scale, with 1 being always and 5 never.

Discussion

In relation to the sociodemographic profile of the offspring, there was a predominance of men, adults, economically active, nonwhite, single, with low schooling. These findings are similar to the profile of the general prison population in Brazil and other countries, such as the USA and Portugal.[14,15]

When considering the association between the variables of the sociodemographic profile of those afflicted in this study with ART adherence, only the female showed a significant association. This result can be related to the maintenance in the prison system of gender relations that determine inequalities in the construction of social roles and the ways of being and living of men and women, producing distinct perceptions about the health and disease process and the concreteness of practices self-care. In addition, historically, the field of health policies and practices has turned to the reception of the demands and care of the female bodies, especially in the field of reproduction, by allocating men to the margin of this care.[16]

Regarding the insertion in the work, which has educational and productive purpose of the inmates, more than a third of the participants affirmed to carry out some labor activity inside the prison unit, whether paid or not. The work has a positive impact on reintegration and reintegration into society, since it grants a penal reduction, shortening every three days of work a day of punishment.[17]

In spite of this concrete possibility of access to work in prison, in 2016, only 15% of the prisoners in Brazil and 13% in the state of São Paulo carried out some work activity internal or external to the prison establishment.[9] This denotes weakness of the system in guaranteeing the right to reintegration and re-socialization of the victim, since work can be the first stage of this process.

In spite of the structural weaknesses already mentioned in the Brazilian prisons, in this study, an important portion of the respondents stated access to the HIV diagnosis in the prison. Such access is given especially in the interview of detainees to the prison system, as well as in specific campaigns (Stay Tuned), by spontaneous demand and the diagnosis of other conditions such as tuberculosis, sexually transmitted infections, among others. In this sense, it is necessary to highlight the potential of the prison system for actions involving the management of HIV infection, characterizing itself as an important point of health care for the diagnosis and access to care of people living with HIV.

Regarding the diagnosis, most of the subjects interviewed have been diagnosed for HIV infection for more than 10 years. This may increase the complexity of care, the overlapping of vulnerabilities, and the accumulation of comorbidities over the years by the very dynamics of the virus in the body, by the living habits of people living with HIV and by prolonged use of ART.[3]

Thus, from the perspective of MACC, it is essential that prison health teams seek to ensure the permanent screening of comorbidities related to the evolution of the disease. Thus, access to specialized medical treatment[12] and ART would be promoted, offering actions based on self-care supported that aim at prevention of these comorbidities, systematic monitoring of therapy and clinical conditions, identifying changes in general health status in timing, with prioritization of medical returns when necessary. This is because most participants stated the presence of health conditions other than HIV, use of drugs other than ART, and history of drug use, elements that increase the complexity of care and may reflect a low adherence to treatment.

These findings reinforce the need to integrate clinical and therapeutic information related to incarcerated HIV-infected incarcerated individuals, as well as unique case-control strategies for therapeutic support, sensitizing and preparing them for concomitant treatment and adoption of healthier lifestyle habits. This is also necessary because of the significant number of participants who, although under medical supervision, had a history of interruption in HIV treatment in their lifetime, which may contribute to the instability of the disease and its worsening of clinical and health conditions, in addition to maintaining the virus transmission chain.

In the present study, discontinuation of medical follow-up showed a statistically significant association with non-adherence to ART, showing that dropout from treatment is not limited to medication intake.[18] According to some reports identified at the time of the interview, one of the possible explanations about the difficulty of carrying out medical follow-up refers to the lack of car availability and escorting to the specialized health service, since judicial demands have priority in the use of resources. The link between practitioners and PLWHAs should be strengthened, promoting clinical and drug follow-up and monitoring and, consequently, therapeutic adherence.[19] There is even a need to reinforce the importance of adherence to treatment through more intensive and inclusive monitoring strategies, capable of instrumentalizing the subjects for shared and team-supported self-care.

The development of a therapeutic environment conducive to HIV management can promote sat-

isfactory health outcomes, which are essential to achieve viral suppression, the immunocompetence of the subjects and, thus, the imposition of barriers to virus transmission.[4] Considering the hard way to reach the goals of UNAIDS towards the end of the epidemic, it should be noted that some of participants had not yet reached viral suppression. This can be related to access to ART, without episodes of delays in the delivery of the drug and the taking of the drug, although sometimes in the wrong way.

In relation to regularity in the process of dispensing ART, this procedure has the penitentiary agent as a key figure. He, together with the nursing team, has an important role in encouraging and monitoring adherence to treatment in its different dimensions, focusing not only on the drug issue, but attending the consultations and performing the tests in coherence with the medical conducts. The penitentiary agent has consolidated its role as a strategic ally in the control of TB in prisons,[20] and may also be for the treatment of HIV infection, since it is the professional who has more contact with detainees and who often establishes the link between these and the health teams, with the need to be incorporated into the training for better results, adherence and health care.

Even so, it becomes urgent to organize and offer a care based on unique strategies to follow the victims with detectable viral load and/or with clinical instability such as the monitoring of the use of ART that was considered regular and/or unsatisfactory, stratification of risk and supportive care in order to stabilize the infection. A clinical mismatch can make the subjects vulnerable to diseases of high incidence in the prison system, such as tuberculosis,[21] besides resulting in unfavorable outcomes such as hospital admission and death.

It was identified that the delay in medication delivery occurred more frequently in the group characterized by irregular use of ART. Such delay can occur in two moments: in the flow of acquisition and arrival of drugs in the unit, once they are dispensed by the health units of reference to the prison security agent; in the delivery of the same to individuals incarcerated in treatment. Also of concern is the large number of participants who reported never or almost never obtaining information on the results of the CD4 + and viral load tests, which were also not included in the prison health records. This aspect is a reflection of the deficiency in the integration between the professionals of the referral services and the prison units, which can cause difficulties in the prioritization of patients to be monitored regarding the use of ART. This fragility also impedes coordination and continuity of care, and should value the registration and sharing of information on the health conditions of individuals.[22]

These findings allow us to reflect on the weaknesses that may affect the integral health care provided to PLWHA in the prison setting, reinforcing the need for intervention strategies for monitoring and therapeutic monitoring, mainly due to the existence of cases with immunological impairment and detectable viral load. Considering that elements of the work process may influence adherence to treatment, it is important to note that all prison units had incomplete health teams, three of which did not have physicians, requiring complementarity of care in out-of-health units. There is also a mismatch between the overcrowding of the prison units and the multiple and complex health needs of the PLWHA in relation to the institutional capacity of the prison health units, with obvious overload and difficulties in the organization of prison work.

Conclusion

Regular use of ART was associated with a statistically significant association with women, and irregular use was associated with discontinuation of medical follow-up and history of use of licit drugs prior to incarceration. The delay in medication delivery occurred more frequently in the group characterized by irregular use of ART. It is important to emphasize the need of the prison health teams to conduct actions aimed at monitoring the regularity of ART use in the logic of the cascade of care, supporting

the subjects for the retention of care and resulting in clinical improvement and viral suppression. In addition, the importance of articulation between the teams of the prison units and the other services that compose care network, whether for assistance, management, surveillance, flow of exams and medicines, and duality of health and safety, which in this context cannot overlap, but rather complement each other.

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Collaborations

Ravanholi GM, Catoia EA, Andrade RLP, Lopes LM, Brunello MEF, Bollela VR, Nemes MIB and Monroe AA declare that they contributed to project design, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

References

1. Levi J, Raymond A, Pozniak A, Vernazza P, Kohler P, Hill A. Can the UNAIDS 90-90-90 target be achieved? A systematic analysis of national HIV treatment cascades. BMJ Glob Health. 2016;1(2):e000010.
2. Wilton J, Liu J, Sullivan A, Rachlis B, Marchand-Austin A, Giles M, et al.; Ontario HIV Epidemiology and Surveillance Initiative. Trends in HIV care cascade engagement among diagnosed people living with HIV in Ontario, Canada: A retrospective, population-based cohort study. PLoS One. 2019;14(1):e0210096.
3. Joint United Nations Programme on HIV/AIDS (UNAIDS). Ending AIDS: progress towards the 90-90-90 targets: global AIDS update, 2017. Geneva: UNAIDS; 2017 [cited 2018 Dec 18]. Available from: http://www.unaids.org/sites/default/files/media_asset/Global_AIDS_update_2017_en.pdf
4. Brasil. Ministério da Saúde. Boletim Epidemiológico HIV/aids, v. 49, nº 53 [Internet]. Brasília (DF): Ministério da Saúde; 2018 [citado 2018 Dez 18]. Disponível em: http://www.aids.gov.br/pt-br/pub/2018/boletim-epidemiologico-hivaids-2018
5. Brasil. Ministério da Saúde. Boletim Epidemiológico HIV/aids, ano III, n. 1 [Internet]. Brasília (DF): Ministério da Saúde; 2014 [citado 2018 Dez 18]. Disponível em: http://www.aids.gov.br/pt-br/node/73
6. Shrestha G, Mulmi R, Yadav DK, Baral D, Yadav BK, Chakravartty A, et al. Health needs and risky behaviours among inmates in the largest prison of eastern Nepal. Int J Prison Health. 2018;14(4):254–67.
7. Reekie JM, Levy MH, Richards AH, Wake CJ, Siddall DA, Beasley HM, et al. Trends in HIV, hepatitis B and hepatitis C prevalence among Australian prisoners - 2004, 2007, 2010. Med J Aust. 2014;200(5):277–80.
8. Ramezani A, Amirmoezi R, Volk JE, Aghakhani A, Zarinfar N, McFarland W, et al. HCV, HBV, and HIV seroprevalence, coinfections, and related behaviors among male injection drug users in Arak, Iran. AIDS Care. 2014;26(9):1122–6.
9. Brasil. Ministério da Justiça e Segurança Pública. Departamento Penitenciário Nacional. Sistema Integrado de Informações Penitenciárias. InfoPen: levantamento nacional de informações penitenciárias – atualização junho de 2016 [Internet]. Brasília: Ministério da Justiça e Segurança Pública, 2017 [citado 2018 Dez 18]. Disponível em: http://depen.gov.br/DEPEN/noticias-1/noticias/infopen-levantamento-nacional-de-informacoes-penitenciarias-2016/relatorio_2016_22111.pdf
10. Shalihu N, Pretorius L, van Dyk A, Vander Stoep A, Hagopian A. Namibian prisoners describe barriers to HIV antiretroviral therapy adherence. AIDS Care. 2014;26(8):968–75.
11. Meyer JP, Cepeda J, Wu J, Trestman RL, Altice FL, Springer SA. Optimization of human immunodeficiency virus treatment during incarceration: viral suppression at the prison gate. JAMA Intern Med. 2014;174(5):721–9.
12. Mendes EV. The care for chronic conditions in Primary Health Care [editorial]. Rev Bras Promoç Saúde. 2018; 31(2):1-3.
13. Sousa AI, Pinto VL, Sousa AI, Pinto VL. Análise espacial e temporal dos casos de aids no Brasil em 1996-2011: áreas de risco aumentado ao longo do tempo. Epidemiol Serv Saude. 2016;25(3):467–76.
14. Dolan K, Wirtz AL, Moazen B, Ndeffo-Mbah M, Galvani A, Kinner SA, et al. Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees. Lancet. 2016;388(10049):1089–102.
15. Nogueira A, Teixeira C, Ferreira C, Ferreira S, Pinto T, Ribeiro T. [Time-trends in human immunodeficiency virus infection in Portugal: 1984-2013]. Arq Med. 2015;29(6):148–52. Portuguese.
16. Botton A, Cunico SD, Strey MN. [Gender differences in the access to health services: necesssary problematization. Mudanças Psicol Saúde. 2017;25(1):67–72. Portuguese.
17. Sliva SM, Samimi C. Social work and prison labor: a restorative model. Soc Work. 2018;63(2):153–60.
18. Menezes EG, Santos SR, Melo GZ, Torrente G, Pinto AS, Goiabeira YN. Factors associated with non-compliance with antiretrovirals in HIV/AIDS patients. Acta Paul Enferm. 2018;31(3):299–304.
19. Madruga LG, Silva GV, Alves VA, Velarde LG, Azeredo TB, Setúbal S, et al. [Aspects related to the use of antiretrovirals in high complexity patients in the state of Rio de Janeiro]. Cien Saude Colet. 2018;23(11):3649–62. Portuguese.
20. Colombelli F, Zilly A, Silva-Sobrinho RA. Agentes penitenciários: a escassez de pesquisas com esses aliados estratégicos no controle da tuberculose nas penitenciárias. Rev Cient FASF Faculdade Sul Fluminense. 2018;3(2):689–700.

21. Barbosa ML, Celino SD, Oliveira LV, Pedraza DF, Costa GM. Primary health care of convicts in the penitentiary system: subsides for nursing performance. Esc Anna Nery. 2014;18(4):586–92.

22. Mendes EV. A construção social da atenção primária à saúde [Internet]. Brasília: Conselho Nacional de Secretários de Saúde – CONASS; 2015. [citado 2018 Dez 18], Disponível http://www.saude.go.gov.br/wp-content/uploads/2016/12/a-construcao-social-da-atencao-primaria-a-saude.pdf