Treatment as prevention from the perspective of people living with HIV/AIDS

Tratamento como prevenção na perspectiva de pessoas vivendo com HIV/aids

Tratamiento como prevención en la perspectiva de personas que viven con el VIH/sida

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How to cite:
Lioi FM, Sousa LR, Elias HC, Gerin L, Gir E, Reis RK. Treatment as prevention from the perspective of people living with HIV/AIDS. Acta Paul Enferm. 2023;36:eAPE012323.

DOI
http://dx.doi.org/10.37689/acta-ape/2023A00123233

Keywords
HIV; Disease prevention; Anti-retroviral agentes; Therapeutics

Descritores
HIV; Prevenção de doenças; Antirretrovirais; Terapêutica

Descriptores
HIV; Prevención de enfermedades; Antirretrovirales; Terapéutica

Submitted
May 13, 2021

Accepted
September 5, 2022

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Associate Editor (Peer review process):
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Abstract

Objective: To analyze factors associated with knowledge about the effectiveness of treatment as prevention for people living with HIV.

Methods: This is a cross-sectional and analytical study carried out with people living with HIV/AIDS treated at five specialized care services in a city in the countryside of São Paulo. Data were collected through individual interviews using a semi-structured questionnaire. The results were analyzed using descriptive and univariate statistics and logistic regression.

Results: 286 people living with HIV participated in the study, 108 (37.8%) men who have sex with men, aged over 45 years (36.4%). It was identified that only 15.0% of participants had knowledge about the effectiveness of treatment as prevention. Not having knowledge about the effectiveness of treatment as prevention was associated with having 2 and 4 sexual partners 0.24 (95%CI 0.08,0.68), using condoms inconsistently 2.69 (95%CI 1.26,5.77), not seeking information 4.31 (95%CI 1.18,15.78) and not disclosing the diagnosis to partners 3.02 (95%CI 1.41,6.48).

Conclusion: Knowledge about the effectiveness of treatment as prevention was low and was associated with higher risk behaviors and practices. Interventions targeting people living with HIV who have serodifferent relationships are urgent and can benefit both partners, be an incentive for achieving and maintaining viral suppression, motivation for treatment compliance with antiretroviral therapy and HIV transmission prevention.

Resumo

Objetivo: Analisar os fatores associados ao conhecimento sobre a eficácia do tratamento como prevenção de pessoas que vivem com o HIV.

Métodos: Estudo transversal e analítico realizado com pessoas que vivem com HIV/aids atendidas em cinco serviços de atendimento especializado em um município do interior paulista. Os dados foram coletados por meio de entrevistas individuais onde se utilizou de um questionário semiestruturado. Os resultados foram analisados por meio da estatística descritiva, univariada e regressão logística.

Resultados: 286 pessoas vivendo com HIV participaram do estudo, 108 (37.8%) homens que fazem sexo com homens, com idade superior a 45 anos (36.4%). Foi identificado que apenas 15,0% dos participantes apresentaram conhecimento sobre a eficácia do tratamento como prevenção. Não ter conhecimento sobre a eficácia do tratamento como prevenção foi associado com ter 2 e 4 parceiros sexuais 0.24 (IC 95% 0.08,0.68), usar o preservativo de forma inconsistente 2.69 (IC 95% 1.26,5.77), não buscar a informação 4.31(IC 95% 1.18,15.78) e não revelar o diagnóstico aos parceiros 3.02 (IC 95%1.41,6.48).

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Conflicts of interest: nothing to declare.

Conclusão: O conhecimento sobre a eficiência do tratamento como prevenção foi baixo e se associou a comportamentos e práticas de maior risco. Intervenções voltadas para as pessoas que vivem com HIV que têm relacionamentos sorodiferentes são urgentes e podem beneficiar ambos os parceiros, ser incentivo para a obtenção e manutenção da supressão viral, motivação para adesão do tratamento com a terapia antirretroviral e prevenção da transmissão sexual do HIV.

Resumen

Objetivo: Analizar los factores asociados a los conocimientos sobre la eficacia del tratamiento como prevención de personas que viven con el VIH.

Métodos: Estudio transversal y analítico realizado con personas que viven con el VIH/sida atendidas en cinco servicios de atención especializada en un municipio del interior del estado de São Paulo. Los datos fueron recopilados por medio de entrevistas individuales donde se utilizó un cuestionario semiestructurado. Los resultados fueron analizados mediante la estadística descriptiva, univariada y regresión logística.

Resultados: Participaron del estudio 286 personas que viven con el VIH, 108 (37,8 %) hombres que tienen relaciones sexuales con hombres, de edad superior a 45 años (36,4 %). Se observó que solo el 15,0 % de los participantes tenía conocimientos sobre la eficacia del tratamiento como prevención. La falta de conocimientos sobre la eficacia del tratamiento como prevención se relacionó con tener dos y cuatro parejas sexuales 0.24 (IC 95 % 0.08,0.68), usar preservativo de forma inconsistente 2.69 (IC 95 % 1.26,5.77), no buscar información 4.31 (IC 95 % 1.18,15.78) y no informar el diagnóstico a las parejas 3.02 (IC 95 % 1.41,6.48).

Conclusión: Los conocimientos sobre la eficiencia del tratamiento como prevención fueron bajos y se asoció a comportamientos y prácticas de mayor riesgo. Es urgente realizar intervenciones orientadas a personas que viven con el VIH que tienen relaciones serodiscordantes, ya que pueden beneficiar a las dos personas de la pareja, ser un incentivo para la obtención y el mantenimiento de la supresión viral y ser motivación para la adhesión al tratamiento antirretroviral y prevención de la transmisión sexual del VIH.

Introduction

Infection caused by the Human Immunodeficiency Virus (HIV) is in its fourth decade and remains a major global health problem. It generates negative reflections on the general health status of people living with HIV (PLHIV) and who do not comply with treatment with antiretroviral therapy (ART) on a regular basis.[1] Among the more than 37 million PLHIV in the world, as of mid-2019, approximately 24.5 million were on antiretroviral drugs (ARV)[2] In addition to the provision of ARVs and regular compliance, researchers agree that one of the priorities in fighting the infection is the early initiation of treatment and the inclusion of these people in a comprehensive health care program.[3]

The goals of early treatment include improving the general health status of PLHIV and achieving viral suppression. In this sense, the Joint United Nations Program on HIV/AIDS (UNAIDS) has set ambitious goals that seek, by the year 2030, to identify 95% of PLHIV, treat 95% of confirmed cases and achieve viral suppression in 95% of people using ARV.[2]

With the advances made in the field of HIV infection prevention, ARV use has been incorporated as a prevention strategy in the context of comprehensive care for PLHIV, known as treatment for all, with the aim of achieving an undetectable viral load, a most important health indicator of non-transmissibility of HIV through sexual contact.[4]The discussion about the effectiveness of ART treatment as a prevention strategy is not recent. Swiss scientists proposed the "Swiss Declaration" in 2008 based on epidemiological data, pointing out that HIV-positive people using ART who had an undetectable viral load for at least six months and who had no other sexually transmitted infections (STIs) did not transmit HIV to their sexual partner.[5]

From the conclusion of other studies, this evidence is well documented in the international literature[6, 7] and its incorporation into clinical practice can strengthen treatment compliance and contribute to HIV transmission prevention. Since then, several campaigns with the undetectable message equal to the intransmissible (I = I) have gained international proportions added to the defense of almost one hundred countries and approximately one thousand organizations.[8-10]

Since 2013, Brazilian national guidelines have recommended the immediate initiation of ART for all PLHIV, regardless of their clinical and/or immunological stage[11] and recognize that the concept of the undetectable equal to the non-transmissible can generate a positive impact on the relationships of PLHIV, as it opposes outdated concepts that all PLHIV are potential transmitters of the virus through sexual contact, which is linked to stigma and prejudice.[12]

However, few Brazilian studies have dedicated themselves to understanding the effects of such messages, especially in population groups of people

included in health services and who experience relationships with HIV-serodifferent partners. Thus, studies are needed that seek to understand the nuances between reception, processing and understanding of the message and, in addition, its implementation in the daily life of PLHIV.

ART treatment represents a radically new way of thinking about HIV prevention, suggesting that condom-free intercourse between serodifferent partners, does not pose a risk of HIV transmission, as long as the HIV-positive partner is virally suppressed and using ART consistently.[13]

Other benefits of ART as a prevention strategy include reducing self-discrimination and stigma of PLHIV by partners, as well as improving relationships and treatment compliance.[14] Using an undetectable viral load, non-transmissibility of HIV through sexual intercourse in undetectable people, as well as regular compliance with ART should be part of a broader prevention plan, called as combined prevention,[4] which is understood as the use of different methods for HIV and other STI prevention.

Moreover, knowledge and beliefs related to HIV can influence PLHIV's behavior, especially in the search for health care, such as regular treatment compliance. Thus, a survey of 1,177 Ethiopian adults indicated that most did not believe that people with an undetectable viral load did not transmit the virus sexually.[15] However, studies that investigated the knowledge of PLHIV about the efficiency of treatment as prevention were carried out in countries with social, economic and cultural differences in Brazil.[16,17]

Although treatment with ART can be effective in preventing HIV transmission, there are gaps in the literature regarding the knowledge of PLHIV about its effectiveness or the willingness of people to use it.[18] Thus, it is important to develop studies that investigate the knowledge of PLHIV about HIV transmission through sex in the era of treatment as prevention. Given the above, the following question emerged for the authors: what factors are associated with knowledge about the effectiveness of treatment as HIV prevention? To answer this question, this study is justified, which aimed to analyze the factors associated with knowledge about the effectiveness of treatment as a prevention for PLHIV.

Methods

This is a cross-sectional and analytical study carried out in five specialized care services for PLHIV/AIDS in the countryside of São Paulo. Data collection took place between July 2016 and July of 2017.

Data collection was carried out through individual interviews, in reserved rooms at the outpatient clinic, before or after the medical consultation, by five duly trained and qualified research assistants. We used a data collection questionnaire designed specifically for this study. Moreover, the Statement Strengthening the Report of Observational Studies in Epidemiology (STROBE) was used to write this manuscript and present the results. The interviews lasted a minimum of 20 and a maximum of 30 minutes. All participants gave their free and informed consent by signing a specific document for this purpose.

To assess knowledge about the effectiveness of treatment as prevention, the following question was asked: Do you think that if you are on ART and your amount of virus circulating in the body (viral load) is undetectable, is it effective to prevent HIV transmission to the partner?

We included PLHIV/AIDS with knowledge of diagnosis of HIV/AIDS infection, aged 18 years or over, undergoing clinical-outpatient follow-up in an outpatient clinic specialized in the care of PLHIV, with active sexual life, seronegative sexual partner or with unknown serology for HIV in the last six months. We excluded people in a situation of confinement, such as detainees and institutionalized and residents in support homes.

Independent variables were: sex (male, female); sexual orientation (heterosexual women, heterosexual men, men who have sex with men); age (in years); education (in years of study); self-reported color (black, brown, indigenous, yellow, white); employment situation (employed, unemployed, not working); family income (minimum wages).

Clinical variables related to HIV were: time of diagnosis (in years) and viral load (detectable for values >40 copies/ml or undetectable ≤40 copies/ml), ARV use (yes, no), presence of other sexually transmitted infections in the last 12 months (yes, no). Behavioral variables related to affective-sexual life were: type of sexual partnership (main, casual, both); number of partners (single, multiple), male condom use (yes, no).

Variables related to counseling received at the health service and behavioral variables: receives guidance from the team regarding the forms of HIV transmission (yes, no); partner has already been invited to attend specialized care services (yes, no); received guidance from the specialized care services team (yes, no); disclosure of diagnosis to partner (yes, no); talking with the partner about condom use (yes, no); seek information on prevention (yes, no); seek information on prevention on the internet (yes, no).

The sample size was calculated using the software R (R Core Team), version 3.4.1 to contemplate the objectives of the study (n=286), considering the approximate number of people registered in specialized care services and the estimate that 62% of PLHIV are sexually active after diagnosis, as described in another study carried out in Ribeirão Preto[19]

Data were entered into a database in Microsoft Excel 2010 and, after double typing, the spreadsheet was exported to the Statistical Package for Social Science (SPSS), version 22.0. Descriptive, univariate statistics and multivariate logistic regression were used for data analysis. Bivariate analyzes were conducted to examine the associations between independent variables and knowledge about the effectiveness of treatment as prevention using chi-square and Fisher's exact tests, adopting a significance level of 5%.

In the regression model, for the selection of independent variables, the automatic procedure of selection of variables called "Stepwise" was used, through the Akaike information criterion.[20] To perform the analyses, we calculated the Odds Ratio (OR) and a 95% confidence interval and adopted a significance level of 5%. The programs used in the analyzes were SPSS (IBM Corp. Released) version 22 and R version 3.5.3.

The study was approved by the Research Ethics Committee of the *Escola de Enfermagem de Ribeirão Preto*, under Opinion 084/2016 and CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 52012515.000000.5393. All participants signed the Informed Consent Form.

Results

A total of 286 PLHIV participated in the study, most of them men who have sex with men (MSM), 108 (37.8%), aged over 45 years (36.4%) and white skin color 151 (52.8%). Regarding economic aspects, it was found that 192 (67.1%) were in the job market and 133 (46.5%) received 2 to 3 minimum wages. Regarding the clinical aspects, 181 (63.3%) had five or more years of diagnosis, 268 (93.3%) were using ART, 216 (75.5%) had an undetectable viral load and 41 (14, 3%) were diagnosed with another STI, according to Table 1.

It was identified that only 43 (15.0%) of participants were aware of the effectiveness of treatment as prevention. As for the sociodemographic variables related to knowledge about the effectiveness of treatment as prevention, no statistically significant differences were observed (Table 2). Although no significant differences were observed, men showed greater knowledge when compared to women. What is also striking is that the youngest PLHIV in the 18-24 age group represented only 11.6% of those who were aware (Table 2).

The perceived effectiveness of treatment as prevention did not vary significantly among PLHIV according to time of diagnosis, viral load value, type and number of sexual partners and other behavioral variables. There was a statistically significant association between having knowledge about the effectiveness of treatment as prevention and talking with the partner about condom use (p=0.04), as shown inTable 3.

Table 4 shows the results of the logistic regression model that showed that knowledge about the effec-

Table 1. Distribution of people living with HIV/AIDS in a serodifferent partnership

Variables	n(%)
Sex	
Female	90(31.5)
Male	196(68.5)
Sexual orientation	
Heterosexual woman	90(31.5)
Heterosexual man	88(30.8)
MSM	108(37.8)
Age group (years)	
18 – 24	23(8.0)
25 – 34	59(20.6)
35 – 44	100(35.0)
≥ 45	104(36.4)
Education (years)	
<11	147(51.4)
≥ 11	139(48.6)
Skin color	
White	151(52.8)
Black/brown	135(47.2)
Employment situation	
Employed	192(67.1)
Unemployed	59(20.6)
Retired/away from work	33(11.5)
Do not work	2(0.7)
Familiar income (minimum wages) *	
<1	59(20.6)
2- 3	133(46.5)
≥ 3	94(32.9)
HIV diagnosis time (years)	
< 2 – 4.9	105(36.7)
≥ 5	181(63.3)
Viral load (copies/ml)	
≤40	216(75.5)
>40	70(24.5)
ARV use	
Yes	268(93.3)
No	18(6.3)
Presence of STI	
Yes	41(14.3)
No	245(85.7)

*Minimum wage value: R$937.00 (about US$170.36)

tiveness of treatment as prevention was associated with having 2 and 4 sexual partners 0.24 (0.08, 0.68), compared to those who in the study had a relationship with only 1 partner. Not having knowledge about the effectiveness of treatment as prevention was associated with inconsistent condom use (vs. consistent) 2.69 (1.26,5.77), not seeking information on HIV prevention 4.31 (1.18,15.78) and not disclosing their HIV status to sexual partners 3.02 (1.41, 6.48).

Table 2. Knowledge about treatment as prevention for people living with HIV/AIDS in a serodifferent partnership

Variables	Knowledge		Total 286 n(%)	p-value
	No 243 n(%)	Yes 43 n(%)		
Sex				
Female	74(30.5)	16(37.2)	90(31.5)	
Male	169(69.5)	27(62.8)	196(68.5)	0.37
Sexual orientation				
Heterosexual man	77(31.7)	11(25.6)	88(30.8)	
Heterosexual woman	74(30.5)	16(37.2)	90(31.5)	0.61
MSM	92(37.9)	16(37.2)	108(37.8)	
Age group (years)				
18-24	18(7.4)	5(11.6)	23(8.0)	
25-34	53(21.8)	6(14.0)	59(20.6)	0.30
35-44	81(33.3)	19(44.2)	100(35.0)	
+45	91(37.4)	13(30.2)	104(36.4)	
Skin color				
White	125(51.9)	26(61.9)	151(53.4)	0.24
Black/brown	116(48.1)	16(38.1)	132(46.6)	
Education (years)				
<11	125(51.4)	22(48.8)	147(51.4)	0.97
> 11	118 (48.6)	21(48.8)	139(48.6)	
Employment situation				
Employed	163(67.1)	29(67.4)	192(67.1)	
Unemployed	51(21.0)	8(18.6)	59(20.6)	0.87
Retired/away from work	27(11.1)	6(14.0)	33(11.5)	
Do not work	2(0.8)	0(0.0)	2(0.7)	

Discussion

The main limitation of this study stems from the fact that data collection was carried out with PLHIV who were being followed up in the specialized service. Thus, the results may not represent the reality of those absent or abandoning treatment. Moreover, data were collected in a medium-sized city in the countryside of the state of São Paulo with social and economic differences when compared to many regions of the country.

On the other hand, the results of the study allow discussions and guidelines for the health team and, particularly, for nurses to redirect nursing actions and interventions in the scope of assistance to PLHIV. Additionally, they may help to increase the population's knowledge, particularly among PLHIV and their sexual partners, about the effectiveness of treatment for HIV infection as a prevention strategy.

Table 3. Knowledge about the effectiveness of treatment as prevention for people living with HIV/AIDS in a serodifferent partnership

Variables	Knowledge		Total 286 n(%)	p-value
	No 243 n(%)	Yes 43 n(%)		
Diagnosis time				
< 2 – 4.9	93(38.3)	12(27.9)	105(36.7)	0.23
≥ 5	150(61.7)	31(72.1)	181(63.3)	
Viral load (copies/ml)				
≤40	140(76.5)	27(81.8)	167(77.3)	0.52
>40	43(23.5)	6(18.2)	49(22.7)	
Presence of STI				
Yes	212(87.2)	33(76.7)	245(85.7)	0.95
No	31(12.8)	10(23.3)	41(14.3)	
Type of partner				
Fixed	128(52.7)	21(48.8)	149(52.1)	0.16
Casual	100(41.2)	22(51.2)	122(42.7)	
Fixed and casual	15(6.2)	0(0)	15(5.2)	
Number of sexual partners				
1	111(60.7)	24(72.7)	135(62.5)	0.21
2-4	55(30.1)	5(15.2)	60(27.8)	
≥ 5	17(9.3)	4(12.1)	21(9.7)	
Condom use				
Consistent	177(72.8)	26(60.5)	203(71.0)	0.10
Inconsistent	66(27.2)	17(39.5)	83(29.0)	
Seek information on prevention				
No	45(18.5)	3(7.0)	43(16.8)	0.07
Yes	198(81.5)	40(93.0)	238(83.2)	
Seek information on prevention on the Internet				
No	148 (60.9)	23(53.5)	171(59.8)	0.36
Yes	95 (36.1)	20(46.5)	115(40.2)	
Received guidance from a health professional				
No	98(40.3)	13(30.2)	111(38.8)	0.21
Yes	145(59.7)	30(69.8)	175(61.2)	
Disclosure of diagnosis for sexual partner				
Disclosed	146(60.6)	20(46.5)	166(58.5)	0.08
Not disclosed	95(39.4)	23(53.5)	118(41.5)	
Talking with partners about condom use				
Yes	127(52.3)	15(34.9)	142(49.7)	0.04
No	116(47.7)	28(65.1)	144(50.3)	

This study identified that knowledge about the effectiveness of treatment as prevention among PLHIV who have a serodiscordant partner was low, which indicates the need to plan and implement campaigns to communicate with PLHIV with clear and unambiguous messages about the effectiveness of equality between undetectability and intransmissibility. It is essential

Table 4. Adjusted model of variables associated with knowledge about the effectiveness of treatment as prevention among people living with HIV/AIDS

Variables	Unadjusted OR (95%CI)	unadjusted p-value	Adjusted OR (95%CI)	p-value
Sexual orientation				
Heterosexual man	1		1	
Heterosexual woman	1.42 (0.61/3.29)	0.415	1.11 (0.42/2.89)	0.836
MSM	1.23 (0.54/2.81)	0.626	0.74 (0.27/2.05)	0.565
Age group				
45 +	1		1	
18-24	2.06 (0.65/6.57)	0.222	3.4 (0.71/16.2)	0.125
25-34	0.87 (0.31/2.47)	0.797	1.22 (0.36/4.16)	0.746
35-44	1.74 (0.8/3.81)	0.166	2.28 (0.94/5.56)	0.070
Skin color				
White	1	0.252	1	0.093
Black/brown	0.67 (0.34/1.32)		0.5 (0.22/1.12)	
Education				
>11	1	0.861	1	0.591
<11	0.94 (0.49/1.82)		0.78 (0.32/1.92)	
Employment situation				
Employed	1		1	
Unemployed	0.87 (0.37/2.02)	0.748	0.99 (0.3751/2.6153)	0.985
Others	1.03 (0.37/2.89)	0.958	0.86 (0.27/2.78)	0.807
HIV diagnosis time				
≥ 5 years	1	0.241	1	0.136
<2 to 4.9 years	0.65(0.32/1.33)		0.51(0.21/1.24)	
Viral load				
Detectable	1	0.610	1	0.771
Undetectable	0.81(0.37/1.8)		0.87(0.34/2.22)	
Type of partner				
Main	1		1	
Casual	1.44 (0.74/2.79)	0.279	1.33 (0.45/3.98)	0.605
Fixed and casual	0 (0.Inf)	0.988	0 (0.Inf)	0.987
Number of sexual partners				
1	1		1	0.007
2-4	0.47 (0.19/1.19)	0.111	0.24 (0.08/0.68)	
≥ 5	0.94 (0.36/2.46)	0.903	0.46 (0.16/1.32)	0.146
Condom use				
Consistent	1	0.137	1	0.011
Inconsistent	1.68 (0.85/3.34)		2.69 (1.26/5.77)	
Seek information on prevention on the Internet				
Yes	1	0.314	1	0.186
No	0.71 (0.37/1.38)		0.55 (0.23/1.33)	
Seek information on HIV prevention				
Yes	1	0.092	1	0.027
No	2.85 (0.84/9.66)		4.31(1.18/15.78)	
Received guidance from a health professional				
Yes	1	0.260	1	0.321
No	0.67 (0.33/1.35)		0.6 (0.22/1.63)	
Disclosure of diagnosis for sexual partner				
Yes	1	0.064	1	0.004
No	1.87 (0.96/3.62)		3.02(1.41/6.48)	
Talking with partners about condom use				
Yes	1	0.050	1	0.275
No	1.97 (1/3.9)		1.78 (0.63/5.01)	

to implement educational strategies by the health team that can consistently improve health literacy among PLHIV on undetectable viral load being equal to non-transmissible (I=I). This result is in line with another study conducted in Brazil that reinforced the urgent need to expand educational strategies in relation to treatment as prevention and the benefits of undetectable viral load for HIV prevention.[21]

The result found in the study differs from other research that shows that awareness and dissemination of treatment as prevention, and movements such as "Undetectable = Intransmissible" (I = I), have grown.[22,23] In fact, the popularization of information will increase the understanding of PLHIV about the effectiveness of treatment as prevention and will be able to insert these people more and more into a broader plan of prevention.

The results showed that PLHIV who had 2 to 4 partners had greater knowledge about the effectiveness of treatment as a prevention compared to those who had only one partner. Greater knowledge was demonstrated in a study by Siegel and Meunier[13] among MSM, where those who reported two or more partners with whom they had anal sex and participants who had more than two anal intercourse in the last 3 months, are more likely to know about treatment as prevention.[13] On the other hand, lower risk perception may be associated with lower understanding of treatment as prevention.

This result is important, as it showed the need to address the type of relationship, sexual partnerships and risk perception among HIV serodifferent couples. Decreased risk perception has been observed in relationships that involve greater intimacy with relaxation in the adoption of preventive strategies, especially after the first month of dating, where condom use is drastically reduced.[11]

PLHIV who have stable affective-sexual relationships had less knowledge about treatment as prevention. This result is particularly important, as it can bring many benefits to HIV transmission prevention, since there are numerous barriers in the perception of risk of HIV transmission and in condom use, even among serodifferent couples.[24] Educational interventions targeting couples in different relationship settings are needed. In this study, it was observed that less knowledge about undetectable viral load being equal to non-transmissible was associated with inconsistent condom use. For decades of public health messages throughout the period of the HIV/AIDS epidemic, condoms were the only effective way to prevent HIV transmission during sexual intercourse between serodifferent partners.[15] Thus, we agree with other researchers who point out that people may remain hesitant to use new prevention strategies until they become more familiar with them or are encouraged to use them.[25] Interventions to include treatment as prevention in the context of combination prevention may benefit PLHIV who have HIV-negative partners who do not consistently use condoms.

Indeed, there is evidence of the difficulties and barriers to consistent condom use, even among HIV-serodifferent partners,[24,26] which can put HIV-negative partners at risk in situations where the HIV-positive partner is not virally suppressed or is not taking ARV appropriately.

PLHIV who did not disclose their diagnosis to their sexual partner were significantly more likely to view treatment as prevention as ineffective. Studies have shown that disclosing the diagnosis of serological status to the sexual partner is associated with the bond and trust one has with the partner and constitutes a barrier to the adoption of HIV prevention methods.[15] In the same vein, HIV-seronegative people, who believe they believe in treatment as prevention, report needing confidence in the fact that their HIV-positive partners comply with their ARV regimen and are accurately representing their viral load.[15]

PLHIV with an undetectable viral load unnecessarily abstained from sexual practices without a condom, avoided a serodifferent partnership, and had anxiety about sexual transmission in the face of perceived risk that is now known to be non-existent.[27] The benefits of PLHIV's knowledge of undetectable viral load being non-transmissible include the incentive to achieve and maintain

viral suppression, which strengthens motivation for compliance with ARV treatment. Educating patients about maintaining an undetectable viral load contributes to reducing HIV-related fear, guilt and self-stigma. Furthermore, patient education facilitates the dissemination of knowledge to partners and social networks. Additionally, treatment as prevention strengthens the public health case for eliminating barriers to universal access to care and treatment.[28]

Individuals who do not seek knowledge about HIV sexual prevention strategies were more likely to be unaware of treatment as prevention. This result is consistent with a study conducted in Scotland which showed that lack of awareness and inequalities in HIV literacy are barriers to treatment as prevention.[29]

In this study, only 173 (61%) participants received information from a health professional regarding treatment as prevention. Therefore, even engaged in health services, they have limited access to HIV transmission prevention, which demonstrates the need for more educational strategies and targeted dissemination in PLHIV/AIDS care services, which was also described in another study conducted in the United States of America.[30]

The meaning of "undetectable" and skepticism about the evidence behind message campaigns related to treatment as prevention are barriers to realizing the benefits of this strategy.[28]

Indeed, there is a notable challenge around consistently communicating the finding that sustained viral suppression eliminates the risk of sexual transmission (undetectable = untransmissible, (I=I) to patients.[13] Failure to routinely incorporate patient education regarding undetectable equals non-transmissible into clinical practice has been documented,[28] with 77% of infection specialists and 42% of care physicians communicating the message to patients when they were reporting their undetectable viral load.

Those who did not communicate with patients justify the action out of disbelief, believing that the risk is not totally reduced, even with scientific evidence (I = I), in addition to the perception that the equality between undetectability and intransmissibility denies the personal responsibility to prevent, also demonstrating concern about risk patients' behaviors and misunderstanding.[28]

Thus, there is evidence of the need to consistently improve health literacy among PLHIV for undetectable viral load to be equal to noncommunicable. A study carried out in the United Kingdom showed that specialist HIV nurses identified a number of potential benefits associated with treatment as prevention, such as decreased fear associated with HIV. However, there is a fear that with implementation as a public health measure it may encourage patients to engage in risky sexual behaviors that include the possibility of disinhibition or sexual coercion in sexual intercourse.[31]

In Kenya, a study showed that despite the awareness that the effective ART use eliminates the risk of HIV transmission through sex, there is both a lack of in-depth knowledge and conviction about the strategy among health professionals and HIV-negative partners in serodifferent relationships.[32]

In Brazil, official approval by the Ministry of Health of the slogan undetectable equals non-transmissible is recent (emphasizing that PLHIV with an undetectable viral load do not transmit HIV to sexual partners) with formal guidance for health professionals to educate the public about the scientific evidence.[14]

Health professionals caring for PLHIV should universally inform their patients to achieve and maintain an undetectable viral load as part of routine HIV care, discussing the risks and benefits of treatment as prevention to contribute to patient decision-making.[12]

Interventions aimed at training nurses for person-centered care are essential, considering that providing accurate information is a fundamental part of preventive work.[33]

The results showed that the non-disclosure of diagnosis by PLHIV to their sexual partner was associated with not knowing the effectiveness of treatment as prevention. It is known that disclosing the HIV diagnosis to the sexual partner is a personal and intimate process that

can affect self-image, self-efficacy, self-perception and confidence[34] and plays a crucial role in raising awareness of the risk of HIV for sexual partners and, consequently, leading to greater HIV testing and counseling, as well as increasing support for PLHIV.[35]

One of the barriers to non-disclosure is related to the fear of HIV transmission to the partner,[35] as well as stigma and discrimination, barriers related to HIV. In this way, a better understanding of the effectiveness of the undetectable HIV viral load being non-transmissible may bring benefits to serodifferent couples, even favoring the disclosure of diagnosis, which can become easier when one can also count on the fact that there is no chance of sexually transmitting HIV if one has good compliance with ART and an undetectable viral load. Thus, the need and importance of greater dissemination of the effectiveness of treatment as prevention for HIV-seronegative sexual partners is also highlighted.

Conclusion

In this study, it was identified that PLHIV, even linked to health services, have limited access to HIV transmission prevention, which shows the need for health education with this population. Health education strategies are needed that include communication with clear and unambiguous messages about the effectiveness of treatment as prevention and the benefits of undetectable viral load for HIV prevention. PLHIV's knowledge of the effectiveness of treatment as prevention was low and was associated with having more than one sexual partner. Less knowledge was associated with inconsistent condom use, not seeking information on sexual HIV prevention, and not disclosing the diagnosis to the partner. Interventions to include treatment as prevention in the context of combination prevention aimed at PLHIV who have serodifferent relationships are necessary and urgent, which can benefit both partners by providing incentives for obtaining and maintaining viral suppression, strengthening motivation for compliance with ART treatment and, consequently, preventing HIV transmission. The results of this study can support the nursing consultation in specialized care services, in addressing the effectiveness of viral load and HIV non-transmissibility as a prevention strategy, which can favor serodiscordant couples in shared decision-making. Serodifferent couples are expected to be able to make informed choices about the risks and benefits of treatment as prevention in relation to the risk of HIV transmission, with the opportunity to reduce HIV-related fear, guilt and self-stigma.

Collaborations

Lioi FM, Sousa LRM, Elias HC, Gerin L, Gir E and Reis RK contributed to study design, data analysis and interpretation, article writing, critical review of the intellectual content and approval of the final version to be published.

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