

Tobacco Smoking and Its Determinants in HIV Infected Patients under Antiretroviral Therapy in Kinshasa, the Democratic Republic of Congo (DRC)

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ABSTRACT

Background: Tobacco smoking is one of the major public health threats and may reverse the improvement in immune status that is achieved from antiretroviral therapy (ART). The aim of this study was to establish the prevalence and determinants of tobacco smoking among Human immunodeficiency virus (HIV) infected patients under ART in Kinshasa, DRC.

Methods: A cross-sectional study was conducted among 400 patients under ART attending the 9 support structures of Kinshasa. Data were summarized using proportions and χ^2 test was used to explore associations between categorical variables. Predictors of tobacco smoking were determined by multiple logistic regression. Level of significance was set at $p < 0.05$.

Results: The prevalence of current cigarette smoking among HIV patients was 8 %. Multivariate analysis shows that male gender [Adjusted Odds Ratio 2,3; 95% Confidence Interval:1,08 -5,05; $p=0,031$], alcohol drinking[AOR 3,8; 95% CI:1,58-9,25; $p=0,003$] and food insecurity[AOR 3,3;95% CI:1,38-8,14; $p=0,031$] were positively associated with tobacco smoking.

Conclusions: The prevalence of tobacco smoking among HIV infected patients in Kinshasa was high. Therefore, smoking should be discouraged in people living with HIV to reduce their morbidity and mortality.

Keywords: Tobacco smoking, determinants, HIV infected patients

INTRODUCTION

Tobacco smoking is one of the major public health threats and most common preventable cause of premature death around the world. [1] Globally, tobacco kills nearly 6 million people each year of which five million deaths are attributed by direct tobacco smoking. [2] Tobacco smoking is highly prevalent amongst people living with HIV /AIDS (PLWHA). A recent analysis in USA revealed that PLWHA were nearly twice as likely to smoke tobacco compared to the general population. [3]

Tobacco smoking has serious adverse health outcomes like carcinoma, chronic obstructive pulmonary disease, cardiovascular disease, cerebrovascular accidents etc. [4] Tobacco smoking among antiretroviral (ARV) treated human immunodeficiency virus (HIV) infected people may reverse the improvement in immune status that is achieved from ART, through the activation of immune cells and rendering them susceptible to HIV. [5] Cigarette smoking is responsible for decreased adherence to antiretroviral

therapy and increased likelihood of acquiring secondary illness and infections in PLWHA. [6]

In developed countries the prevalence of smoking in ARV treated HIV infected people were high (59%). [7] In south Africa, the study conducted by Mashinya et al. reported prevalence of 21 %. [8] The prevalence of smoking reported from Nigeria by Edward et al. was 1.9%. [9] In the latest Democratic Republic of the Congo (DRC) Demographic and Health Survey (2013-2014) (Enquête Démographique et de Santé RDC II 2013-2014), the tobacco smoking prevalence in the general population in Kinshasa was 0.2% among females and 13.4% among males. [10]

There are not publications about smoking in ARV treated HIV infected people in the DRC.

We thus aimed at estimating the prevalence of tobacco smoking among HIV-infected subjects treated with ART in Kinshasa and its determinants.

METHODS

Study design

The study was cross-sectional sub-study of the main project on 'Determinants of non-adherence to antiretroviral therapy among HIV-infected patients in Kinshasa'. The study was conducted in Kinshasa from May 2015 to August 2015. We randomly 9 support structures for PLWHA from 63 following more than 100 patients in Kinshasa: Kimia, Liziba, Amoongo, Bomoto, Bomoi Health Center, OCC, Boyambi, Lisungi and Bolingo. These structures had a global active file of 5724 HIV infected patients treated with ART.

Study population

The sample size was computed using the following formula $n \geq Z^2 pq / d^2$, where the p represents the proportion of tobacco smoking in HIV patients (we assumed that p = 50 % because this proportion in the DRC is unknown), q (1 - p), z value of the standard normal distribution corresponding to a significance level of alpha of 0.05 (1.96) and d the precision degree that we

assumed to 5 % too. The minimal size computed was 384 patients. A total of 422 patients present in the health facilities were selected but only 400 (95 %) were eligible and enrolled.

Inclusion criteria

The inclusion criteria adopted for the study included consenting out patients diagnosed and confirmed to be HIV positive at least 18 years of age and had been on ART for 3 months.

Exclusion criteria

PLWHA who did not start ART and pregnant women were excluded.

Data collection

The data collection was conducted from May to August 2015. The WHO stepwise approach to surveillance (STEPS) questionnaire (WHO) was used to obtain information on age, gender, marital status, level of education, household income, religion, ART duration and HIV disease duration, alcohol consumption and tobacco smoking of the participant, food insecurity and adherence to ART.

Measures

Questions related to tobacco consumption were assessed with a standardized questionnaire adapted from several forms previously used in epidemiological studies conducted in Africa [11,12] Regular smokers were defined as present smokers who smoked at least one cigarette per day for one year or more in accordance to the WHO definition. [13] Food insecurity was measured by the Household Food Insecurity Access Scale (HFIAS). [14]

Statistical analysis

Statistical analysis was performed using SPSS version 21. The Chi-square test was used to compare categorical variables between tobacco smokers and non tobacco smokers. A logistic regression model was used for multivariate analyses of the determinants of smoking consumption. Variables that were also identified in the literature as related to smoking tobacco were systematically included in the model. Proportion and Odds Ratio (OR) estimates

were reported with their 95% Confidence Interval (95% CI).

Ethics

Ethical approval was obtained from the ethic committee of University of Kinshasa (ESP/CE/086/2015) and all study participants have signed an informed consent form.

RESULTS

General characteristics

A total of 400 ART-treated patients were included in the present study. Of the 400 ARV treated HIV infected participants, 309 (77.3 %) were females and 91(22.7 %)

were males. The median age of was 46 years (interquartile range [IQR] 18–75 years).

The majority (38.30%) of the respondents belonged to 40 to 49 years of age. The majority of the respondents (41.0%) were married and (65.4) had secondary education (Table 1).

Smoking prevalence

Among the 400 enrolled patients, the prevalence of smoking consumption was 8 %, 6.1% and 14.3% respectively among female and male participants.

Table 1: General characteristics of ARV treated HIV infected tobacco and non-tobacco

Variable	Total (N=400)	Tobacco-use		p-value
		Yes (n=32)	No (n=368)	
Gender				0.014
Male	91(22.8)	13(40.6)	78(21.2)	
Female	309(77.3)	19(59.4)	290(78.8)	
Age	45,0±10.6	44,0±10.8	45,1±10.5	0.612
<30 years	24(6.0)	1(3.1)	23(6.3)	
30 - 39 years	100(25.0)	9(28.1)	91(24.7)	
40 - 49 years	133(33.3)	13(40.6)	120(32.6)	
50 - 59 years	103(25.8)	5(15.6)	98(26.6)	
>60 years	40(10.0)	4(12.5)	36(9.8)	
Marital status				0.316
unmarried	85(21.3)	8(25.0)	77(20.9)	
married	164(41.0)	13(40.6)	151(41.0)	
Divorced	56(14.0)	7(21.9)	49(13.3)	
widow	95(23.8)	4(12.5)	91(24.7)	
Level of education				0.555
No education	22(5.5)	3(9.4)	19(5.2)	
Primary	50(12.5)	2(6.3)	48(13.1)	
Secondary	261(65.4)	22(68.8)	239(65.1)	
Higher	66(16.5)	5(15.6)	61(16.6)	
Alcohol				0.005
Yes	45(11.2)	9(28.1)	36(9.8)	
No	355(88.8)	23(71.9)	332(90.2)	
Food insecurity				0.007
Yes	225(56.3)	25(78.1)	200(54.3)	
No	175(43.8)	7(21.9)	168(45.7)	
Religion				0,950
Catholicchristian	77(19,3)	7(21,9)	70(19,0)	
Protestant christian	57(14,3)	4(12,5)	53(14,4)	
Survivalchurcheschristian	200(50,0)	15(46,9)	185(50,3)	
Others	66(16,5)	6(18,8)	60(16,3)	
Householdincome				0,203
<60 dollars	203(50,8)	19(59,4)	184(50,0)	
≥60 dollars	197(49,3)	13(40,6)	184(50,0)	
ART treatment duration	85,9±14,3	84,8±13,9	86,0±14,4	0,653
HIV disease duration	94,2±9,0	91,6±7,2	94,4±9,1	0,101

HIV: Human Immunodeficiency Virus; ARV: antiretroviral. Data is presented in number (percentage) format Other* : muslim, kimbagist

Factors associated with tobacco smoking

The present study examined the association of age, gender, marital status, level of education, alcohol consumption, food insecurity, adherence with tobacco use.

In the multivariate logistic regression model, male gender [AOR 2,3; 95% C I:1,08-5,05; p=0,031], alcohol drinking [AOR 3,8; 95% CI:1,58-9,25;p=0,003] and food insecurity[AOR 3,3;95% CI:1,38-

8,14;p=0,031] remained positively associated with tobacco use (Table 2) .

Table 2: Factors associated with tobacco smoking in HIV-infected patients on antiretroviral therapy.

	Multivariate analysis		
Variable	AOR	95% CI	p-value
Gender			
Female	1		
Male	2.3	1.08-5.05	0.031
Alcohol consumption			
No	1		
Yes	3.8	1.58-9.25	0.003
Food insecurity			
No	1		
Yes	3.3	1.38-8.14	0.031
Constant	0.047		0.012

OR: Odds Ratio; AOR: Adjusted Odds Ration; CI: Confidence Interval

DISCUSSION

The prevalence of tobacco smoking among ARV-treated HIV infected people in the present study was 8%, 6.1% among females and 14.3% among males. This was much higher compared to the prevalence of smoking reported from Nigeria by Edward et al. (1.9%) [9]. Higher prevalence of smoking was reported from Brazil (28.9%) and from USA (59%) among HIV infected people. [15,16] the differences in smoking prevalence between developed and African countries could be explained by lifestyle differences. [17] Another explanation could be that Tobacco smoking in HIV/AIDS patients from industrialized countries has been shown to be elevated and higher than in the general population with approximately half of patients being regular smokers. This high frequency of tobacco smoking is at least partly related to the presence of a specific subpopulation of multidrug users with particularly high rate of smoking. [18]

However, the proportion of smokers in HIV infected patients from Africa might grow in the coming years. Recent reports emphasized that tobacco industries are actively engaging in the market of low- and middle-income countries, including those in Africa, in order to compensate for the incurred losses in the Northern Hemisphere at a time when the demand in these countries is decreasing. [19,20,21]

In our study male gender, alcohol drinking and food insecurity were positively associated with tobacco smoking.

Desalu et al. showed also that male gender were associated to tobacco smoking in PLWHA. [17] The important variation of smoking prevalence according to gender is in accordance with most previous studies conducted in HIV-negative populations on the African continent. [22]

There is some evidence that this particularly unbalanced sex ratio in smokers might now be evolving in Africa. Reports from the “Global youth tobacco surveillance” showed that the prevalence figures of current smoking in randomly selected samples of schoolchildren in Benin, Côte d’Ivoire and Mali were 11.2% (95% CI 7.4–16.5), 19.3% (95% CI 16.1–23.0) and 41.8% (95% CI 34.0–50.0) in boys compared to 1.8% (95% CI 0.9–3.6), 7.1% (95% CI 5.1–9.9) and 4.6% (95% CI 2.7–7.7) in girls, respectively. [23]

Alcohol consumers were 3.8times more likely to smoke than non-alcohol consumers. This result emphasize the need to simultaneously counsel HIV infected people under ART on dangers of alcohol consumption during tobacco smoking counselling sessions. The association of tobacco smoking with alcohol consumption was also observed by other studies. [8, 24,25] The tobacco smoking and alcohol consumption are dangerous to health. Alcohol consumption by people receiving ART should be discouraged as it may interfere with ART adherence and possible risk of cardiovascular disease (CVD) induced by the HIV infection, while alcohol may not present direct risk for CVD. [8, 26,27]

The association between food insecurity and cigarette smoking was previously documented, with findings showing higher smoking prevalence among members of low-income families with past-year food insecurity (44%) than their food-secure counterparts (32%). Another study reported that food insecurity among households with at least one adult smoker (26%) was higher than among households

with no adult smokers (12%). [28,29] Socioeconomically disadvantaged young adults with food insecurity may be considered a high-risk group with respect to cigarette smoking. Efforts to reduce tobacco-related health disparities should address diverse sources of socioeconomic influences, including experiences of food insecurity. [30]

Limitation

First, as measures were self reported and no biochemical verification was made, individuals were prone to memory bias, especially the former smokers, and social desirability bias. Memory bias may have overestimated the number of cigarettes smoked among those who quit. Social desirability bias may have underestimated overall prevalence of smoking as it can be understood as an unapproved behavior. The cross sectional design of the study limits inference, but it gives a relationship hence the need for longitudinal study.

CONCLUSIONS

The present study showed that tobacco smoking among HIV infected people under ART was common. This study identified male sex, alcohol consumption and food insecurity as significant determinants of tobacco use. With special focus on those predictors intervention campaign could be developed to reduce the prevalence of non-communicable diseases associated to tobacco smoking in DRC.

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