



PREVALENCE AND FACTORS ASSOCIATED WITH HYPERTENSION AMONG PEOPLE LIVING WITH HIV AT KIBAGABAGA DISTRICT HOSPITAL

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ABSTRACT

Background-Hypertension is a leading modifiable risk factor for cardiovascular disease and people living with HIV (PLWH) are at increased risk of hypertension. Globally, almost one billion people have hypertension; of these, two-thirds are in developing countries (He, Bonner, & Anderson, 2016). Globally, 9.4 million deaths are attributed to hypertension. Our study was to determine the prevalence and factors associated with hypertension among people living with HIV at Kibagabaga District Hospital (KDH).

Methods- A cross-sectional study was done using data from people living with HIV who attended KDH during the study period. A total of 301 PLWH were selected through systematic random sampling. A detailed semi-structured questionnaire was used to collect primary data while secondary data was collected from their files. SPSS version 22 was used for data analysis; descriptive statistics was used to analysis socio-demographic, lifestyle characteristics of respondents.

Results-The prevalence of hypertension among PLWH seeking care at KDH was 15.6%. Findings on factors associated with hypertension show that respondents in age bracket of 61 years and above were at high risk of having hypertension ($p < 0.001$) compared to those aged between 20-49 years. Compared with widowed PLWH being single was associated with hypertension ($p = 0.027$). Education level was an associated factor of hypertension

($p < 0.001$). Being physically inactive were associated with higher risk of hypertension among PLWH. Overweight respondents had higher risk of hypertension ($p < 0.001$) compared with normal weight status in PLWH. Being obese was also associated with higher risk of hypertension ($p = 0.010$) among PLWH seeking care at KDH.

Conclusion- In this study it was found that the prevalence of hypertension among PLWH at KDH was 15.6% and most important significant predictors for developing hypertension are age 61 years and above, education level, physical inactivity and being overweight or obese. The most important statistical significant demographics related to hypertension were age and physical inactivity ($p\text{-value} < 0.001$). This study reveals that most of the independent variables were associated with dependent variable.

Introduction

Globally, nearly one billion people have hypertension; of these, two-thirds are in developing countries (He, Bonner, & Anderson, 2016). Globally, 9.4 million deaths are attributed to hypertension. Attempts should be made to detect complications of hypertension early before irreversible organ damage becomes apparent (Twagirimukiza et al., 2011).

Hypertension has been identified as the single greatest contributor to the global burden of disease and mortality, with estimates suggesting that the highest levels of blood pressure have shifted from high-income countries to low-income countries in sub-Saharan Africa (Vedanthan, Ray, Fuster, & Magenheim, 2019). Hypertension is a major cardiovascular risk factor that is closely associated with lethal complications like coronary artery disease, cerebro-vascular accidents, heart and renal failure (Longo et al., 2012). Hypertension is an overwhelming global challenge, which ranks third as a means of reduction in disability-adjusted life-years (Kearney et al., 2005). Besides, it is the leading cause of mortality (Kearney, Whelton, Reynolds, Whelton, & He, 2004). The new epidemic of hypertension and cardiovascular diseases is not only an important public health problem, but it will also

have a big economic impact as a significant proportion of the productive population becomes chronically ill or die, leaving their families in poverty (Lloyd-Sherlock, 2010).

According to (Yusuf, Reddy, Ôunpuu, & Anand, 2001), hypertension has been identified as the leading risk factor globally and is rated third as a cause of disability-adjusted-life years (DALYs). Hypertension is the leading cause of the cardiovascular diseases in Africa where it is a mainly causes heart failure (Kaiyo, 2016), coronary artery disease, stroke, peripheral artery disease (Onyekwere, Okwuchi, & Samuel, 2013) which are complications of hypertension. Improper hypertension diagnosis and difficulties in controlling blood pressure among the diagnosed patients predisposes to complications of hypertension which increases death and disability with which results in an overburdened health care resource-base (Kaiyo, 2016).

The exact causes of hypertension are not known, but it has associated factors (Longo, et al., 2012). According to the studies conducted in Addis Ababa and Gondar the prevalence of hypertension was high probably indicating a hidden epidemic in those communities (Awoke, Awoke, Alemu, & Megabiaw, 2012; Tesfaye, Byass, & Wall, 2009).

In Rwanda, like many other developing countries, Rwanda is in a phase of epidemiological transition. The overall prevalence of hypertension in Rwanda was 15.4% (95% CI: 14.6%–16.3%); this was 16.5% (95% CI: 15.1%–18.0%) among males and 14.4% (95% CI: 13.4%–15.5%) among females (Uwingabire, 2017).

A cross-sectional survey conducted at an urban tertiary education institution in Rwanda found that 36% of employees were hypertensive and demonstrated a low level of awareness among hypertensive participants (Banyangiriki & Phillips, 2013). Low awareness was also documented in a study conducted among hypertensive patients enrolled in the outpatient department of Kigali University Teaching Hospital (Kamali & Kagame, 2012).

This pattern is associated with improvements in the socioeconomic status of the country in the last 20 years resulting in changes in lifestyle (Nahimana et al., 2018). A study conducted in Bugesera district in 2007 estimated the prevalence of hypertension at 16.8%, this study identified age, overweight, dietary intake and physical inactivity as risk factors associated with development of hypertension (De Ramirez, et al., 2010).

METHODS

STUDY DESIGN, SITE AND POPULATION

This was a cross-sectional. The study used quantitative approach. The study area was KDH in Gasabo District, Kigali City, Rwanda. The study involved PLWH who came to KDH for ARV (Antiretroviral) during this study period from August to October and these were PLWH aged above 18 years who are eligible to start ARVs according to the WHO guidelines.

Sampling was done using systematic random sampling of PLWH attending

the KDH. PLWH were given numbers on arrival at the Hospital and the first participant selected randomly between 1 and 4. Every 4th patient was subsequently selected and requested to participate in the study. Those who declined to take part and those who had already been interviewed on a previous date were excluded from the sampling frame.

Study procedures

After getting permission to do the research from MKUR and from the administration of KDH where the research was conducted, the study used the following description to undergo the research: PLWH who attended KDH during the time of the study were considered. A well-structured and developed research questionnaire was used to collect some information from the PLWH. The questionnaire was first pre-tested on persons not familiar with the subject to see if the questions were valid the study objectives. After seeking their informed consent, PLWH were asked their level of education, how often do they do physical exercises and their economic status as well as other demographic features and then the secondary data was obtained from their files.

Statistical Analysis

The data was analyzed by using statistical package social science (SPSS) version 22. Descriptive analysis was computed whereby Pearson's chi square test and odds ratio with corresponding 95% confidence interval was computed to establish the association between the dependent variable and independent variable. Bivariate analysis was performed to find out variables associated with hypertension among PLWH, variable with p-value less than 0.05 in bivariate analysis were taken in multivariate analysis to identify factors associated with hypertension among PLWH at KDH. All variables with p-value less than 0.05 in multivariate analysis were considered as factors associated with hypertension.

Results

The socio-demographic characteristics of PLWH seeking care at KDH as shown in figure 4.1

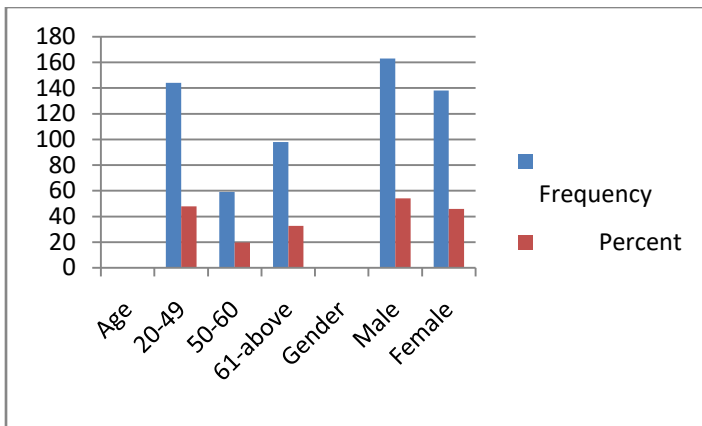


Figure 4.1: Socio-demographic characteristics of PLWH at KDH

A total of 301 PLWH aged more than 18 years old in KDH were recruited. The range of ages were 20 and above. Out of 301 study participant, 47.8% were aged 20-49 years old, while where 32.6% were in the age group of 61 and above. Majority 54.2% of the participants were males.

Prevalence of Hypertension among People Living with HIV at Kibagabaga District Hospital

The prevalence of hypertension among PLWH seeking care at KDH was 15.6% as shown on figure 4.2

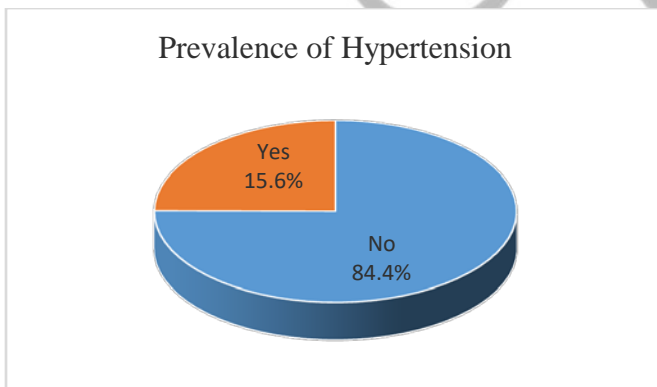


Figure 4. 1: Prevalence of Hypertension

Factors associated with hypertension

The findings show that 80.9% of respondents with hypertension were aged 61 years old and above, while only one respondent with hypertension was aged 20-49 years old. Age group was statistically associated with hypertension with a p-value of <0.001. Gender was not statistically associated with hypertension among people living with HIV, the findings shows that 61.7% of PLWH with hypertension were male. Marital status of respondents was statistically associated with hypertension among PLWH seeking care at KDH (p=0.009), 40.9% of respondents with hypertension were divorced. Educa-

tion level was statistically associated with hypertension among PLWH (p=0.004), among 47 respondents with hypertension 63.8% had only primary education. Smoking was statistically associated with hypertension among PLWH (p<0.001), 78.8% of hypertensive patients were smokers. Concerning socio-category class (*ubudehe*), 19(40.4%) of respondents with hypertension were in *ubudehe* category two, no statistical association observed between *ubudehe* category and having hypertension among PLWH. Among 47 respondents with hypertension, 32(68.1%) never perform any physical activity, physical activity was statistically associated with hypertension among PLWH (p<0.001). Alcohol consumption among PLWH was not associated with hypertension, 26(55.3%) of respondents with hypertension consume alcohol. Occupation of respondents was not statistically associated with hypertension among PLWH, 31(66.0%) of respondents with hypertension were unemployed. Among 47 respondents with hypertension, 31(66.0%) of respondents with hypertension had family history of hypertension, had family history of hypertension was statistically associated with hypertension among PLWH (p<0.001).

Body mass index of respondents was statistically associated with hypertension among PLWH at KDH (p<0.001), 15(31.9%) of respondents with hypertension were overweight, 13(27.7%) of respondents with hypertension were underweight.

Variables with p-value less than 0.05 were taken to multivariate analysis to examine the factors associated with hypertension among PLWH at KDH.

In multivariate analysis, Findings on factors associated with hypertension show that respondents in age bracket of 61 years and above were at high risk of having hypertension [AOR=12.155; 95%CI: 12.155-674.808 ; p<0.001] compared to those aged between 20-49years. Compared with widowed PLWH being single was associated with hypertension [AOR=0.095; 95%CI: 0.012-0.765; p=0.027]. PLWH with primary education were fourteen times more likely to have hypertension [AOR=14.835; 95%CI: 4.092-53.787; p<0.001] compared to those with secondary education and above. Smoking was a risk factor for hypertension among PLWH, findings show that smokers were five times at risk of having hypertension [AOR=4.943; 95%CI: 1.265-19.322; p=0.022] when compared to none smokers. Being physically inactive were associated with higher risk of hypertension among PLWH [AOR=24.408; 95%CI: 7.046-84.548; p<0.001]. Overweight respondents had higher risk of hypertension [AOR=40.622; 95%CI: 6.432-256.563; p<0.001] compared with normal weight status in PLWH. Being obese was also associated with higher risk of hypertension [AOR=5.965; 95%CI: 1.536-23.163; p=0.010] among PLWH seeking care at KDH. This study reveals that most of the independents variables are associated with dependent variable.

Discussion

The main research objective of the study was to find out the prevalence and factors associated with hypertension among PLWH at KDH including these specific objectives which were to determine the prevalence of Hypertension among PLWH and to determine the factors associated with hypertension among PLWH at KDH.

The prevalence of hypertension among PLWH at KDH was 15.6%. The finding from current study is not in agreement with the other previous studies which have demonstrated that the prevalence of hypertension in the general population is increasing in sub-Saharan Africa (Danaei et al., 2011) and the region of West Africa is at especially high risk (Forouzanfar et al., 2017). For more than half the countries in the West Africa, the prevalence of HTN is >30% (Bosu, Reilly, Aheto, & Zucchelli, 2019; Sarfo et al., 2018). And this is not consistent with our finding that, the overall prevalence of hypertension among PLWH was 15.6 percent.

The prevalence of hypertension in HIV infected patients seems to vary from country to country. Although there were no similar published studies that were available in Africa, the prevalence found in this study was lower than that found in most developed countries. One possible explanation for this could be differences in lifestyles between people in Africa and those of developed countries. Some studies that have been done have found people from developed countries to be having a lot of weight than those in Africa. As a result, their BMI is higher than that of most Africans and hence more at risk of hypertension (Cooper et al., 1997) and it's found that people in developed countries have a high consumption of processed food which highly contributes to weight gain. Overweight respondents had higher risk of hypertension [AOR=40.622; 95%CI: 6.432-256.563; $p<0.001$] compared with normal weight status of PLWH. Being obese was also associated with higher risk of hypertension [AOR=5.965; 95%CI: 1.536-23.163; $p=0.010$] among PLWH seeking KDH. This is in line with a study done in France among HIV positive patients showed that a high body mass index increased the risk of hypertension (Thiebaut et al.,2005) a study done in France among HIV positive patients showed that a high body mass index increased the risk of hypertension. Actually, having more weight than normal cause high blood pressure because the more weight someone has, the more blood that needs to supply oxygen and nutrients in the body and these results in pressure.

There was a significant association between Smoking and hypertension among PLWH at KDH where findings show that smokers were five time more likely to have hypertension [AOR=4.943; 95%CI: 1.265-19.322; $p=0.022$] when compared to none smokers. This could be caused by the nicotine in cigarette smoke which raises blood pressure and narrows arteries and leads to blood clotting. This agrees with some researchers who found smoking to be a risk factor for hypertension (Tuomilehto et al., 1982; Mann et al., 1991), other researchers have not found any association between smoking and hypertension. In fact some of the researchers have reported lower blood pressure levels in smokers than in non smokers (Berglund et al., 1975; Seltzer, 1974). In a nationwide survey involving 33,860 people in England, (Pri-

masta et al.,2001) were able to show a positive association between smoking and hypertension.

Advancement in age has been cited as a risk factor for hypertension (Thiebaut et al.,2005). There was a significant association between age and having hypertension in PLWH at KDH where results show that respondents in age bracket of 61 years and above were at high risk of having hypertension [AOR=12.155; 95%CI: 12.155-674.808 ; $p<0.001$] compared to those aged between 20-49years. This comes in line with several studies that have shown that growing old is associated with increased risk for hypertension (Poulter et al. 1984, Cooper et al. 1997, Edwards et al., 2000). Some of the studies conducted among PLWH that have indicated that hypertension increases with advancing age include (Thiebaut et al.,2005), (Jung et al.,2004), and (Jerico et al., 2005). PLWH have low Immune system and also old people have weakened immune system which put them at risk of opportunistic diseases and so it's even found that in this study that there was a significant association between hypertension and age. At KDH education level was associated with hypertension where PLWH with primary education were fourteen times at risk to have hypertension [AOR=14.835; 95%CI: 4.092-53.787; $p<0.001$] compared to those with secondary education and above. This is where it's found that educated people are aware of risk factors and they know how to take actions to avoid those factors which can lead them to hypertension. It's also found that the majority of PLWH at KDH are in class 2 of Ubudehe which might be a factor of having low education level.

Being physical inactive were associated with higher risk of hypertension among PLWH at KDH [AOR=24.408; 95%CI: 7.046-84.548; $p<0.001$]. It has been shown that among people who have regular physical exercises, the risk of developing hypertension is much lower. In patients who are already hypertensive, regular exercise has been shown to reduce their blood pressure significantly. (Cornelissen et al.,2005) observed that regular physical exercises reduces blood pressure. Compared with widowed PLWH being single was associated with hypertension [AOR=0.095; 95%CI: 0.012-0.765; $p=0.027$]. The same factor has been identified as an associated factor of hypertension in a meta-analysis of 34 studies with more than 2,000,000 participants which demonstrated the influence of marital status on the risk of having hypertension. The results of this meta-analysis showed that there was an association between marital status and hypertension where single participants had increased odds of cardiovascular disease compared with married participants (Ramezankhani A, 2019). PLWH are being single at a high rate may be because it's mandatory to check for HIV status before getting married and it's not common to find a couple that agrees to live although one of them is having HIV which might results to this number of single PLWH at KDH.

In this study at KDH, there was no significant association between family history and having hypertension [$p=0.214$] where in other studies it is found that having a member of the family with hypertension from a first degree relative was found to be associated with hypertension. Researchers that have found an association between family history of hypertension and hyperten-

sion include (Gazzaruso et al.,2002). Considering that several studies have found hypertension to be hereditary, it is possible that the information obtained in this study was not absolute and hence the insignificant results obtained.

However the study revealed that there was association between hypertension in almost of variables and is in line with the reported results of (Crane et al., 2011; Riddler et al., 2007) who reported that Well-known cardiovascular risk factors such as age and BMI were confirmed as strong risk factors of hypertension.

Conclusion

In this study it was found that the prevalence of hypertension among PLWH at KDH was 15.6% and most important significant predictors for developing hypertension are age 61years and above, education, physical inactivity and being overweight or obese. 15.6% of PLWH at KDH have hypertension. The most important statistical significant demographics related to hypertension were age and physical inactivity (p-value<0.001).This study reveals that most of the independents variables were associated with dependent variable.

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