Hypertension and Physical Intimate Partner Violence among Female HIV Patients in Butiama District, North-Western Tanzania

Getera Isack Nyangi and Elizabeth Emmanuel Mackanja

ABSTRACT

Highly active antiretroviral therapy (HAART) has greatly improved life expectancy and quality of life among people living with HIV. However, hypertension has been reported to increase among HIV patients. Yet the exact cause has not been established. We conducted a cross-sectional study involving female HIV-infected patients on ART who attended care and treatment clinics (CTCs) between August 2020 to December 2020. The participants were consecutively enrolled until the targeted sample size was attained. Hypertension was defined as systolic blood pressure (SBP) ≥ 140mmHg and, diastolic blood pressure (DBP) ≥ 90mmHg. The exposure variable of interest was self-reported physical intimate partner violence in the last 12 months which was collected and defined according to World Health Organization (WHO) criteria. We investigated 526 female HIV patients on ART with a mean age of 42.8 years. Of all participants, 87.1% were females, about 60% were greater than 60 years old and 22.5% were currently consuming alcohol. 23.8% of the participants had reported a history of physical intimate partner violence in the last 12 months. The overall prevalence of hypertension in female HIV patients on ART was 31.4% and it was not statistically significant associated with physical intimate partner violence in the last 12 months before and after adjusting for other covariates. The prevalence of hypertension in female HIV patients on ART was higher but was not found to be influenced by physical intimate partner violence in the last 12 months. Further studies are recommended to investigate the influence of physical violence on hypertension among HIV patients.

Keywords: Care and treatment clinic, human immunodeficiency virus, hypertension, physical intimate partner violence.

I. INTRODUCTION

Effective use of antiretroviral therapy (ART) has greatly improved the quality of life and survival of people living with HIV/AIDS [1]. However, the incidence rate and mortality from cardiovascular risk including hypertension have reportedly been increasing [2], [3]. According to a meta-analysis, hypertension prevalence of 34.7% has been reported among HIV patients with little variation across genders [4]. In Tanzania, hypertension prevalence in HIV patients on ART has been reported to be 28.3% compared to a lesser 5.3% in HIV ART-naïve and 16.3% in HIV negative individuals [5].

The contributing factors for hypertension in HIV patients are complex and may include socio-demographic, genetics, ART medications, immune response, and inflammation [2], [5], [6]. Meanwhile previous studies that were conducted in the general population indicated that psychosocial factors such as physical intimate partner violence (IPV) may attenuate cardiovascular risks including hypertension [7]. In 2015, [8] reported a significant association between physical violence and hypertension among adults in the general population.

The underlying mechanism for physical IPV induced hypertension is complex. Physical violence induced stress tend to increases the levels of inflammatory markers such as interleukin-6, tumor necrosis factor, platelet activation, and C-reactive protein factors that are involved in the atherosclerotic process and cardiovascular reactivity [9]-[11]. Another possible mechanism is through activation of the hypothalamic-pituitary-adrenal axis, resulting in an elevated level of cortisol, which in turn can cause elevated blood pressure [12].

Traditional and non-traditional risks for hypertension such as age, obesity, and anti-retroviral medications have been investigated extensively among individuals living with HIV/AIDS [2], [4], [13]. However, the influence of behavioral factors such as physical IPV on hypertension
among HIV patients remains unclear. Also, while a conceptual link between physical IPV and hypertension exists, substantial gaps of evidence remain within the context of HIV/AIDS.

Therefore, we investigated whether physical IPV may influence hypertension in female HIV patients on ART. We aim to contribute to the growing body of literature regarding the wider context of determinants of health specifically the influence of physical IPV on hypertension among HIV patients.

To the best of our knowledge, this cross-sectional study is the first of its kind in Tanzania to investigate the association between physical IPV and hypertension among female HIV patients on ART.

II. METHODS

We conducted a cross-sectional study involving female HIV-infected individuals on ART who attended care and treatment clinics (CTCs), between August 2020 to December 2020. The study area is located in Butiama District, Northwestern Tanzania. Data were collected from 3 public CTCs (one district hospital, one health center, and one dispensary) which were purposely selected based on their relatively larger size. The inclusion criteria were being female HIV positive, aged greater than 18, on ART, who gave consent for participation. Women who reported to be pregnant and those on contraceptive pills were excluded. The participants were then consecutively enrolled until the targeted sample size was achieved.

For sample size estimates we used the prevalence of hypertension (P) of 28.7%, from a cross-study among HIV patients that was conducted in Mwanza Tanzania [5]. The final sample size used was 628. Blood pressure was measured on the right arm, using a mercury sphygmomanometer of appropriate size, with individual participants sitting in a relaxed and upright position. Two readings were taken 10 minutes apart and an average of two readings was used [14]. Hypertension was defined as systolic blood pressure (SBP) of ≥140mmHg and, diastolic blood pressure (DBP) of ≥90mmHg [14].

Bodyweight (accuracy of 0.1kg) was measured using Seca patients weighing machines with individual participants in minimal clothes and wearing no shoes. Body height was measured using a stadiometer (accuracy of 0.1cm) with individual participants wearing no shoes.

The structured questionnaire was used to collect a history of intimate physical violence in the past 12 months, by trained health care workers. Questions for assessing physical IPV were adapted from the WHO multi-country study [15].

The outcome variable was hypertension defined as blood pressure ≥ 140mmHg/90mm Hg [14]. The exposure variable of interest was the history of physical IPV in the last 12 months defined as behavior within an intimate relationship that causes physical harm to those in the close relationship by using acts such as slapping, hitting, kicking and, beating [15].

III. DATA MANAGEMENT AND ANALYSIS

Data was collected using a study questionnaire, then coded using a codebook followed by the manual entry in an excel sheet. The analysis was done using Stata software version 13. Logistic regression was used to assess the association between physical IPV in the last 12 months and hypertension. During the analysis p-value of ≤ 0.05 was considered statistically significant.

IV. ETHICAL APPROVAL

The study was approved by an institutional review board of the Northern Zone Health Research Ethics Committee (KNCHREC). Oral informed consent was obtained from individual participants before data collection.

V. RESULTS

We included 526 participants out of a planned sample size of 628 in the final analysis. We couldn’t attain the planned sample size of 628 because of logistics. Out of all participants, 87.1% were peasants, about 60% were older than 40 years, 22.5% were current alcohol drinkers, (19%) had a family history of hypertension and about 25% were either overweight or obese. Altogether 23.8% of all women reported physical IPV in the last 12 months (Table I).

In our current study, the overall prevalence of hypertension in female HIV patients on ART was 91 (31.4%). The prevalence of hypertension was 42(33.9%) in those reporting physical IPV in last 12 month compared to 123 (30.7%) in those without a history of physical IPV in last 12 months (Table II).

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<th>TABLE I: BASELINE CHARACTERISTICS OF THE PARTICIPANTS</th>
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<td>Factors of interest</td>
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A. Variable with Some Missed Data

In the univariate logistic regression analysis, the factors associated with increased odds of having hypertension that were statistically significant were: age 30-39 years, 3.36 (1.52-7.40) 0.003, age 40-49 years, 4.25 (1.97-9.16) 0.000 and those aged ≥ 50 years, 8.65 (4.02-18.45) 0.000 and overweight 1.65 (1.04-2.61) 0.034 (Table III). Both physical IPV in last 12 months, current alcohol drinker, current cigarette smoker, and family history of hypertension were not statistically significant associated with increased odds of having hypertension during the univariate analysis (Table III).

During the multivariate analysis (adjusted for age, alcohol drinkers, cigarette smoking, BMI, family history of hypertension), increasing age was the only factor associated with increased odds of having hypertension that was found to be statistically significant. The odds ratio was as follows: 30-39 years, OR= 3.39 (1.52-7.54) 0.003, age 40-49 years, OR= 4.15 (1.90-9.09) 0.000 and aged ≥ 50 years, OR= 9.13 (4.19-19.93) 0.000 (Table IV).

Though the association between physical IPV and hypertension was attenuated in the multivariate analysis, the association remains statistically insignificant; less severe physical IPV; OR= 1.60 (0.87-2.95) 0.132 and severe physical IPV; OR= 1.35 (0.70-2.60) 0.370, (p-value ≤ 0.05) (Table IV).
VI. DISCUSSION

Physical violence is increasingly associated with hypertension pathogenesis, but our results failed to indicate a statistically significant association between a history of physical intimate IPV in the last 12 months and hypertension among female HIV patients on ART. Our result is similar to a study by Clark CJ et al, which also reported no association of physical IPV and hypertension [16]. However, the two studies differ in several ways hence any conclusion should be made with caution. The study by Clark CJ, was a longitudinal study, from the general population in northern America while our current study was a cross-sectional study which included female HIV patients from a country in sub-Sahara Africa.

After a thorough search of the literature, we failed to retrieve any previous study which investigated the association between physical IPV and hypertension among individuals living with HIV/AIDS. This may be the first study of its kind to analyze the association between physical IPV and hypertension among individuals living with HIV/AIDS.

From the results of our current study, the association between physical IPV and hypertension was attenuated (increasing odds ratio) during the multivariate analysis, though the association remains statistically insignificant; OR = 1.50 (0.92-2.44) 0.105, (p-value ≤ 0.05) (Table IV). Even after physical IPV was stratified according to severity, still the association remains statistically insignificant; less severe IPV; OR= 1.60 (0.87-2.95) 0.132 and severe IPV; OR= 1.35 (0.70-2.60) 0.370, p-value ≤ 0.05). The statistically insignificant result, between physical IPV and hypertension can be due to the similarity in the prevalence of hypertension (33.9% vs 30.7%, Table II), between those with and without a history of physical IPV in the last 12 months resulting in a low power to detect a meaningful difference.

Despite our results failing to indicate a statistically significant association (based on p-value ≤ 0.05) between physical IPV and hypertension, we believe that there is biological relevance based on previous literature [9], [10]. It is plausible that, stress due to physical violence tends to increase the levels of inflammatory markers such as interleukin-6, tumour necrosis factor, platelets activation and C-reactive protein factors that are involved in the atherosclerotic process [10], [11].

In the HIV/AIDS context there are other possible causes and contributing factors for the rise of inflammatory markers, as in the case of the immune reconstitution inflammatory syndrome (IRIS) following initiation of ART [2]. However, in our current study, we cannot tell with confidence the influence of the immune system and inflammation, because these factors were not taken into consideration in our current study. It’s possible that our results were insignificant because we didn’t examine immune related factors such as CD4 cell count. Further research is needed to examine potential pathways linking physical violence and hypertension in HIV patients. We hypothesize that female HIV patients who reported a prior history of physical violence have a higher inflammatory turn-over following initiation of ART, and therefore have an increased overall cardiovascular risk.

Another biological plausibility is that individuals exposed to violence tend to be involved in behavior such as smoking cigarettes and alcohol consumption (a coping mechanism for stress-induced by violence) [17]. Both smoking cigarettes and over-consumption of alcohol are known to be a risk factor for hypertension. In our current study, we observed that about 40% of current cigarette smokers reported physical IPV in the last 12 months and 55% were hypertensive.

Meanwhile out of all current alcohol drinkers 63% reported physical IPV in the last 12 months, and about 32% of them were hypertensive. All these indicate a positive correlation between cigarette smoking, alcohol consumption and a history of physical intimate partner violence in the last 12 months. However, underestimating the true magnitude of smokers and alcohol drinkers due to reporting bias is possible in our current study.

We faced the following limitations: cross-sectional studies cannot establish causality. The prevalence of physical IPV in our study may have been underestimated because women subjected to IPV may have been less willing to disclose information on physical violence due to fear of retaliation from an abusive partner.

Also, the history of physical IPV was limited to the last 12 months. We didn’t capture lifetime histories of physical IPV such as during the childhood and adolescent years. Finally, we did not include HIV-negative individuals to make a comparison between the two groups.

VII. CONCLUSION AND RECOMMENDATION

Hypertension is prevalent among female HIV patients on ART. Our current study indicated the prevalence of hypertension among female HIV patients on ART was 31.4%.

Although the association between physical IPV and hypertension have been reported in general population, in our current study the association between physical IPV in the last 12 months and hypertension was not statistically significant. The prevalence of hypertension was 42(33.9%) in those reporting physical IPV in last 12 month compared to 123 (30.7%) in those without a history of physical IPV in last 12 months.

Regular screening of blood pressure among people living with HIV/AIDS is recommended. Future prospective studies are recommended to investigate more fully the influence of physical IPV on hypertension among people living with HIV/AIDS.

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CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

REFERENCES