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Prevalence of Hypertension amongst Adults Attending Jinja Regional Referral Hospital, Jinja City (Eastern Uganda)

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ABSTRACT

Globally, hypertension is a major contributor to morbidity and mortality, especially in low- and middle-income nations. The purpose of this study was to find out how common hypertension was among the adult patients at Jinja Regional Referral Hospital in Jinja City, Eastern Uganda. Over a predetermined length of time, a cross-sectional study was carried out with a sample of adults who visited the hospital for a variety of reasons. Standardised techniques were used to take blood pressure readings, and structured interviews were used to gather demographic data. The frequency of hypertension and its risk variables were evaluated. The results show a high prevalence of hypertension in this community, highlighting the critical need for public health initiatives and enhanced accessibility to medical care in Eastern Uganda for the prevention, early identification, and treatment of hypertension. In order to lower the prevalence of hypertension and its related consequences in the area, healthcare policies and strategies will benefit from the important epidemiological data this study provides.

Keywords: Hypertension; Prevalence; Adults; Jinja Regional Referral Hospital; Eastern Uganda

INTRODUCTION

Globally, an estimated 26% of the world's population (972 million people) has hypertension, and the prevalence is expected to increase to 29% by 2025, driven largely by increases in economically developing nations [1]. The high prevalence of hypertension exacts a tremendous public health burden. As a primary contributor to heart disease and stroke, the first and third leading causes of death worldwide, respectively, high blood pressure was the top modifiable risk factor for disability adjusted life-years lost worldwide[2]. It causes 7.5–9.4 million premature deaths, accounting for about 12.8 percent of all deaths worldwide [2, 3]. Every year, at least 7.5 million people die because of Hypertension (HTN), and is regarded as the silent killer since it has no symptoms until it has progressed to an advanced state. It has been linked to heart problems, insulin resistance, obesity, hyperuricemia, and atherosclerosis [4, 5]. Hypertension causes end-stage critical organ damage such as hypertensive nephropathy, retinopathy, neuropathy, and cerebrovascular accidents (CVA) by affecting the architecture and functioning of microvasculature (vasculopathy)[6]. Cardiomyopathies, Ischemic Heart Diseases (45 percent) (Acute coronary syndrome / myocardial infarction), heart failure, renal failure, and CVA (51 percent) (Strokes, cerebral infarction) [7] are the leading causes of early death among hypertensive patients (30-70 years) [7]. In Africa it is not yet the leading cause of death, but according to the WHO NCDs Country Profile 2016, NCDs are the biggest cause of mortality worldwide, with the developed nations bearing the brunt of the disease. They were responsible for 68 percent of all fatalities (38 million) in 2018, up from 60 percent in 2010 [8, 9]. Hypertension is a threat to public health as well as a silent killer, impacting about 26.4 percent of Adult Ugandans aged 18 and accounting for 26.3 percent of Hypertensive Adults aged 18 in Eastern Uganda alone [10, 11]. This is marginally lower than the 2008 HTN profile (34.2 percent illness burden), with men and females accounting for 36.0 percent and 32.5 percent, respectively. This costs the country about half of the expected annual economic production loss of $500 billion [12, 13]. According to Uganda's, this alarming sickness burden associated with NCDs is predicted to skyrocket in the next years, posing the threat of a dual burden of infectious and non-infectious illnesses. If nothing is done, the number of people dying from NCDs like hypertension is expected to rise by 17–24% in the next decade. If current trends continue, NCDs such as hypertension would account for seven out of ten deaths in developing countries like Uganda by 2020, killing 52 million people annually by 2030. However, in rural, peri-urban, and metropolitan contexts, there is a serious lack of data on hypertension and related variables, prompting a study to inform stakeholders during policy creation, hypertension prevention, and management. As a result, the overarching purpose of this research is to learn more about the factors that influence hypertension in the Jinja Regional Referral Hospital, Jinja District. The aim of this study is to assess the determinants of hypertension among adults seeking healthcare at JRRH, Jinja City, Jinja District (Uganda).

METHODOLOGY

Study Design

A quantitative cross-sectional hospital based descriptive and analytical study design was conducted in one selected hospital (JRRH).

Area of Study

This research took place in Jinja Regional Referral Hospital's GOPD and Medical Ward in Jinja Municipality, Jinja District, in Uganda's eastern region. Jinja Regional Referral Hospital, or simply Jinja Hospital, is a hospital located in Jinja, Uganda's Eastern Region. It has 600 beds, making it the largest hospital in eastern Uganda.

Study Population

Adults who attended GOPD / MOPC and or those admitted at medical wards of JRRH during the time of study and met the inclusion criteria, were studied.

Inclusion Criteria

Adults ≥ 18years who attended GOPD / MOPD and or those admitted at medical wards of JRRH during the time of study, with informed consent were included in the study.

Exclusion Criteria

Hypertensive patients in hypertensive crisis (Hypertensive Urgency or emergency) were excluded. Similarly, respondents in deteriorating health state (critically ill) to actively and freely participate, and those who declined or gave partial information required for this study were excluded.

Sample Size Calculation

Using Kirsch and Leslie formula[14]; sample size was:

$$n = \frac{Z^2_{a/2} \times (1 - P)}{\delta 2}$$

Where:

$Za/_2$ = confidence level at 95% (standard value of 1.96);

P = 26.3% Adults ≥ 18 years are Hypertensive in Eastern Uganda (Guwatudde D et al. 2015) The Epidemiology of Hypertension in Uganda: Findings from the National Non-Communicable Diseases Risk Factor Survey. PLoS ONE 10(9): e0138991. doi: 10.1371/journal.pone.0138991)

δ= margin of error at 5% (standard value of 0.05).

Thus, sample size was; $n = \frac{[(1.96)2 \times 0.263(0.737)]}{(0.05)^2}$

$= \frac{0.7446 \text{ patients}}{0.0025}$

$= 297.84$ patients

≈ 298 patients

Sampling Method

The researcher employed a Random sampling method to select adults who met the inclusion criteria and offered informed consent.

Data Collection Method

Respondents were given semi-structured standard questionnaires. As variables for the study, the questionnaire measured patients' socio-demographics, clinical risk factors, and co-morbidities related with hypertension. The questionnaires were designed with the study objectives and conceptual framework in mind. The questionnaires were standardized while considering the respondents' domain, validity/relevance to the study objectives, sensitivity of questions, and ethical issues. One week before data collection, questionnaires were pretested for validity and relevance in accordance with the guidelines of the Research committee (IREC; JRRH). In addition to the data collected from participants, a research review checklist was utilized to analyze health records in order to establish background information on the chosen health facilities as well as the local (remote) burden of hypertension in the study area.

Data Analysis

The acquired data was organized in MS Excel Spreadsheet application software before being sent to IBM SPSS – 20 analytical program for further analysis. Data sets were cross tabulated and displayed as figures, proportions, percentages, correlations, central trends, and dispersions using bivariate and multinomial logistic regression models.

Ethical Considerations

Official approval and administrative approvals were requested from the relevant offices, including the SAHS KIU, health facility/medical ward heads, and attending practitioners at the GOPD/MOPD. All respondents were told in the best

language possible about the kind, interest, and purpose of the study, and their free agreement were asked in writing. Neither the participants' names nor initials were recorded anywhere during the data gathering process. All data obtained were kept secret and owned by the participants.

RESULTS

This cross-sectional hospital-based study on hypertension and related variables was undertaken at JRRH Jinja Municipality's MOPD and Medical Ward. Using standard pretested questionnaires and randomized sample selection methods, quantitative and qualitative data were collected from 279 respondents (97.1 percent of the planned sample size) and analyzed in MS Excel and IBM SPSS 20 at the P 0.05 significant level.

Prevalence of Hypertension ≥ 18years

The prevalence of hypertension among adults was at 20.8 %, varying in the respective sectors as 15.1 and 27.6% in MOPD and Medical Ward respectively (Table 1).

Table 1: Prevalence and variation of hypertension in JRRH, Jinja Municipality

	Hypertension (HTN)		
Health Sector of JRRH	**Yes n (%)**	**No n (%)**	**Total N (%)**
MOPD	23 (15.1)	129 (84.9)	152 (100)
Medical Ward	35 (27.6)	92(72.4)	127 (100)
Total N (%)	**58(20.8)**	**221 (79.2)**	**279(100)**

Socio-Demographic Factors Associated with Hypertension

Respondents were 39 years old on average (SD = 20). Around 59.9 percent of respondents were female, with Basoga (64.9 percent) dominating and Catholics accounting for the plurality (40.5 percent). The majority (56.6 percent) of respondents were married, the majority (34.4 percent) had elementary education, roughly 36.7 percent were peasant farmers, and the majority (52.0 percent) lived in rural areas. A multinomial logistic regression analysis revealed that age is substantially (P=0.031) linked with hypertension, with younger people (44years) having lower chances (OR 0.22, 95%; 0.001 – 0.95) of acquiring hypertension than older people (45years). Individuals' education levels were substantially (P = 0.002) related with hypertension, with participants with low education levels (None/primary) 16 to 20 times more likely to be connected with hypertension than counterparts with high education levels (secondary/tertiary education). Finally, hypertension was almost 9 times higher in urban participants than in rural respondents (Table 2).

Table 2: Socio-demographic Factors Associated with Hypertension at JRRH – Jinja Municipality

	Hypertension (HTN)				
	Yes [n (%)]	**No [n (%)]**	**Total [N(%)]**	**Odds Ratio (OR, 95%CI)**	P –Value
Age (yrs.)					**0.031**
18 - 24	2	92	**94(33.7)**	0.07 (0.01 –0.67)	0.021
25 - 34	6	42	48	0.22 (0.05 – 0.95)	0.043
35 - 44	8	29	37	0.22 (0.06 – 0.85)	0.028
45- 54	15	25	40	0.78 (0.23 – 2.59)	0.681
55 – 64	7	12	19	0.97 (0.25 – 3.66)	0.958
≥ 65	20	21	41	Ref.	-
Sex					0.130
Male	26	86	112	1.92 (0.82 – 4.47)	0.131
Female	32	135	167 (**59.9**)	Ref.	-

Tribe					0.350
Musoga	37	144	81(**64.9**)	0.59 (0.14 – 2.47)	0.466
Mugishu	9	20	29	0.54 (0.10 – 3.00)	0.483
Iteso	4	5	9	1.90 (0.14 – 25.22)	0.626
Baganda	3	11	14	4.18 (0.36 – 49.25)	0.255
Others	5	41	46	Ref.	-
Religion					0.451
Protestant	24	82	106	0.67 (0.04 – 11.65)	0.785
Catholic	28	85	113(**40.5**)	0.52 (0.03 – 8.92)	0.651
Muslim	2	27	29	0.15 (0.01 – 4.38)	0.271
Pentecostals	3	22	25	0.27 (0.01 – 6.03)	0.406
Others	1	5	6	Ref.	-
Marital Status					**0.381**
Single/Relationship	2	88	90	0.27 (0.04 – 2.10)	0.212
Married/Cohabiting	44	114	158(**56.6**)	0.87 (0.30-2.52)	0.795
Separated/ Divorced	12	19	31	Ref.	-
Level of Education					**0.002**
None	20	33	53	16.44 (1.19-226.43)	0.036
Primary	34	62	96(34.4)	19.82 (1.61-244.33)	0.020
Secondary	3	74	77	1.18 (0.10- 14.35)	0.896
Tertiary	1	52	53	Ref	-
Occupation					**0.497**
Peasant	39	66	105(37.6)	1.73 (0.12-24.94)	0.689
Farmer	13	48	61	0.76 (0.06-10.55)	0.838
Business/self-employed	5	34	39	1.55 (0.11- 20.94)	0.743
others	1	73	74	Ref.	-
Residence					<0.001
Urban	32	102	134	8.73(3.23-23.56)	<0.001
Rural	26	119	145(52.0)	Ref.	-
TOTAL N (%)	58 (20.8)	221 (79.2)	279 (100)		

Clinical Factors and Co-morbidities Associated with Hypertension

In the research individuals, dietary salt consumption was strongly (P0.001) related with hypertension, with modest salt intake [12 Table spoon (6g)] considerably (P 0.05) protective against hypertension. Matooke was the most common (60.2 percent) staple meal, with 2.69 chances of being associated with hypertension among research participants. Respondents who drank alcohol or smoked cigarettes were around 3 and 6 times more likely to develop hypertension than their counterparts. Participants who exercised on a regular basis had a lower risk of acquiring hypertension (OR = 0.15, 95% CI: 0.07–0.32) than their counterparts.

A respondent's average BMI was 24.0 (SD 4.4). A respondent's BMI was substantially (P = 0.001) related with hypertension, with a normal BMI (18.5 - 24.9) being considerably (P = 0.002) protective against hypertension (OR = 0.05, 95%; 0.01 – 0.32). In the research, having a family history of hypertension was associated with a 2.3-fold increased risk of hypertension. Certain morbidities were highly (P = 0.001) related with hypertension in respondents. When compared to their contemporaries, study participants with diabetes mellitus and renal disorders were 4 and 7 times more likely to acquire hypertension (Table 3).

Table 3: Life style, Clinical factors and Co-morbidities associated with Hypertension

	Hypertension (HTN)				
	Yes n (%)	**No n (%)**	**Total N (%)**	**Odds Ratio (OR, 95% CI)**	**P – Value**
Dietary Salt per day					**<0.001**
≤ ¼ Table spoon (1 –3g)	10	68	78	0.10 (0.02 – 0.52)	0.006
≤ ½ Table spoon (4 –6g)	13	89	102 (**36.6**)	0.09 (0.02 – 0.42)	0.002
> ½ Table spoon (>6g)	30	60	90	0.31 (0.07 –1.50)	0.146
Restricted Salt intakeor don't take at all	5	4	9	Ref.	-
Staple food					**0.028**
Matooke	41	127	168 (**60.2**)	2.69 (1.22 – 5.95)	0.014
Potato/Cassava	7	18	25	2.91 (0.90 – 9.42)	0.075
Posho/Millet/Rice	10	76	86	Ref.	-
Qty of Carbohydrates per serving					0.213
≤ ¼ a standard plate	2	18	20(**7.2**)	0.53 (0.09 – 3.09)	0.479
¼ - ½ a standard plate	10	54	64	0.78 (0.27 – 2.24)	0.645
½ - 1 standard plate	36	103	139(**49.8**)	1.60 (0.70 – 3.68)	0.299
>1 standard plate	10	46	56	Ref.	-
Qty of Fruits & Veg.per serving					0.610
≤ ½ a standard plate	11	44	55 (**19.7**)	0.97 (0.43 – 2.18)	0.944
½ - 1 a standard plate	1	11	12	0.28 (0.03 – 2.37)	0.242
>1 standard plate Eat occasionally ordon't eat at all	2	8	10	0.98 (0.17 – 5.57)	0.979
	44	158	202 (**72.4**)	Ref.	-
Drink Alcohol					**0.028**
YesNo	18	38	56 (**20.1**)	2.76 (1.12 – 6.76)	0.027
	40	183	223	Ref.	-
Cigarette Smoking					**0.020**
Yes No	7	4	11(**3.9**)	5.88 (1.28 – 27.03)	0.023
	51	217	268	Ref.	-
Perform Regular exercise					**<0.001**
Yes	13	142	155	0.15 (0.07 – 0.32)	<0.001
No	45	79	124(**44.4**)	Ref.	-
BMI (kg/m²)					**< 0.001**
< 18.5	2	14	16	0.04 (0.00 – 0.46)	0.010

18.5 – 24.9	15	148	163 (**58.4**)	0.05 (0.01 – 0.32)	0.002
25 – 29.9	26	44	70	0.30 (0.05 – 1.89)	0.200
30 – 34.9	11	12	23	0.52 (0.07 – 3.78)	0.520
≥ 35	4	3	7	Ref.	-
History of familial Hypertension					0.019
Yes	28	57	85	2.30 (1.15 – 4.57)	**0.018**
No	30	164	194	Ref.	-
Co-Morbidity					**<0.001**
Yes	42	72	114	2.93 (1.38 – 6.28)	0.005
No	16	149	165	Ref.	-
Type of Co-morbidity					**0.011**
Diabetes mellitus	11	149	165	4.05 (1.25 – 13.16)	0.020
(DM)	4	8	19	1.87 (0.41 – 8.52)	0.416
Liver disease	10	5	15	6.81 (1.46 – 31.85)	0.015
Renal disease	17	5	71	Ref.	-
Others					
Drugs					0.791
Yes	48	104	152	1.59 (0.06 – 44.46)	0.785
No	10	117	127	Ref.	-
Type of Drugs					0.461
NSAIDs	13	41	54	1.05 (0.39 – 2.87)	0.923
Contraceptives	10	19	29	3.70 (0.90 – 15.33)	0.071
Steroids	6	8	14	0.76 (0.14 – 4.09)	0.751
Vasoconstrictors/ Sympathetic/anti-cholinergic drugs	3	5	8	1.18 (0.18 – 7.69)	0.864
Others	16	32	48	Ref.	-
Total N (%)	**58**(**20.8**)	221	**279** (100)		

DISCUSSION

The prevalence of hypertension among adults in our study was at 20.8%, and this was lower than the age-standardized prevalence (ASP) of hypertension in Sub-Saharan Africa, which was 25.9% [15, 16], and Uganda's overall prevalence of Hypertension (HTN) in Adults aged 18 years an above, which was 26.4%. This, however, was greater than the total prevalence of hypertension (15%) in a comprehensive study in Uganda's Wakiso area (Kayima et al., 2015). According to the National NCD risk factors survey [17], the overall prevalence of hypertension (HTN) in adults aged 18 years is 26.4 percent, with the highest prevalence in the central region (28.5%), followed by the eastern region (26.4%), western region (26.3%), and northern region (23.3%). [18]. This study therefore noted a lower prevalence rate as compared to the respective regional averages, but within range, however. Age is substantially related with hypertension, according to a multinomial logistic regression study, with young age (<44 years) having lower odds of acquiring hypertension than elderly age (>45 years). This was consistent with previous research such as the National NCD Risk Factors Survey [19], a four-country cross-sectional study in Sub-Sahara Africa [19] This is assumed to be related to aging's diminished vascular compliance, which increases peripheral resistance against which the heart pumps blood, resulting in hypertension. Participants with low education levels (None/primary) were 16 to 20 times more likely to be linked with hypertension than peers with high education levels (secondary/tertiary education), according to the study. This was consistent with findings from a cross-sectional study in urban Varanasi, which found that illiterate subjects were more likely to develop hypertension than their literate counterparts [20]; and a four-country cross-sectional study in Sub-Sahara Africa , which found that low education was significantly associated with hypertension [16, 18]. Schools of thought have it that individuals with high level of education acquire basic health education knowledge and skills on health lifestyle necessary to prevent lifestyle diseases such as hypertension unlike their counterparts. Hence, hypertension is directly associated to level of education. Finally, this study found that hypertension was 9 times more prevalent in urban patients than in rural subjects. This was consistent with the findings of the National NCD Risk Factors Survey [21]; the cross-sectional study in Sub-Sahara Africa [21]; and the findings of a research in southern China [21]. This might be attributed to the adoption of contemporary dangerous lifestyles such as consuming junk food, drinking alcohol, and smoking, as well as living sedentary lives and contributing to rising environmental pollution. As a result, hypertension is highly related with urban vs rural residency.

Physical activity, according to certain schools of thought, has a direct role in maintaining a normal lipid profile and lowering superfluous body fat, particularly in blood vessels, which would otherwise predispose to atherosclerosis and therefore hypertension. Regular physical activity therefore protects people against hypertension. The study found that an individual's BMI was substantially linked to hypertension, with a normal BMI (18.5-24.9) being significantly protective against hypertension (OR = 0.05, 95%; 0.01– 0.32). Earlier studies, such as a national survey on hypertension in Uganda [3]; a four-country cross-sectional study in Sub-Sahara Africa; and a multivariable analysis in the municipality of Kathmandu (Nepal), concluded that higher BMI (25 kg/m2) was strongly associated with hypertension [22]. Body weight and free fat are proportional to BMI. As a result, increasing BMI and obesity are linked to an increase in free fatty acid availability and insulin resistance. These alterations in lipid profile may contribute to oxidative stress [23], leading to atherosclerosis, cardiovascular diseases including hypertension, diabetes and kidney disease. Therefore, a normal BMI is protective against hypertension unlike excess BMI. Having a family history of hypertension had 2.3 odds of associated to hypertension in study subjects. This is true with essential hypertension especially with genetic predisposition such as familial Hyperlipidemia, vasculopathies and genetic co-morbidities including diabetes and kidney diseases. Thus, family history of hypertension is directly associated to hypertension. The study showed that certain morbidities were strongly associated with hypertension. Study subjects with diabetes mellitus and renal diseases were 4 and 7 times more likely to develop hypertension compared to their counterparts. This rhymed with a multivariable logistic regression analysis in Northwest Ethiopia a four-country cross sectional study in Sub-Sahara Africa [21]. This is due in part to compromise cardiovascular function in kidney diseases, and micro-vasculopathy complications of diabetes. Therefore, early diagnosis and management of associated morbidities such as kidney disease and diabetes mellitus can reduce the risk of developing preeclampsia.

CONCLUSION

Hypertension is still common in persons over the age of 18, with 20.8 percent having the condition. Among socio-demographic characteristics, hypertension is substantially (P = 0.05) related with low education levels (none/primary) and urban locations. The study also showed that among lifestyle clinical variables, hypertension is substantially (P0.05) related with Matooke, drinking alcohol, and smoking cigarettes. Finally, a family history of hypertension, as well as specific morbidities such as diabetes and renal illness, were found to be substantially related with hypertension. However, youthful age (44years), modest dietary salt consumption (12 Table spoons of salt (6g), frequent exercise, and a normal BMI (18.5 – 24.9kg/m2) were protective against hypertension. According to the hospital attendants, this study was done in Jinja, Eastern Uganda, and examined hypertension and related variables in low - intermediate resource settings. As a result, the conclusion may not be reflective of hypertension and related variables in high-resource settings. Because critically ill individuals were

omitted from the trial, this targeted investigation did not analyze hypertensive crisis and emergency. As a result, the results may not be exhaustive of the hypertensive spectrum. Due to restricted resources, including time, money, and fiscal resources, the scope of the investigation was confined to the available resources.

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