

A BASELINE STUDY ASSESSING HYPERTENSION PREVALENCE AND MANAGEMENT IN FIVE PERIPHERAL HEALTH UNITS IN TONKOLINI DISTRICT, SIERRA LEONE.

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Original Article

ABSTRACT

Introduction

Hypertension is a common non communicable disease worldwide. Studies suggest high prevalence of hypertension in low- and middle-income countries as Sierra Leone. This study aims to provide an overview of the current prevalence and management of hypertension in five peripheral health units (PHUs) prior to an intervention study.

Methods

This study was a prospective baseline study in Yele, Tonkolini District in Sierra Leone, conducted from February 2022 till April 2022. Health care workers in charge of each facility were interviewed upon current hypertension management. Univariate analysis was conducted to report data. Chi-square testing was done to assess influence of variables on hypertension.

Results

A total number of 112 patients were included in the study. Eighty-six were females which accounted for 76% of the sample. Median age of the sample was 40 (IQR 25-59).

In total 38 (33%) patients had unknown hypertension and 4 (3.5%) patients had unknown malignant hypertension. Age above 40 years was significantly associated with hypertension ($P < 0.001$). Health care workers indicated to not have access to a working blood pressure machine in 4 out of 5 facilities, antihypertensive medication was not available in 4 out of 5 facilities and referral practices for suspected hypertension cases were poor.

Conclusion

This baseline study showed a high prevalence of hypertension in five PHU facilities near Yele, Tonkolili District, Sierra Leone. Challenges in current management of hypertension in PHUs near Yele involved and lacking availability of medical equipment such as blood pressure machines and medication.

INTRODUCTION

Hypertension in LMICs

Hypertension is a common non communicable disease worldwide. Approximately 1.3 billion people suffer from this condition.¹ According to the WHO data this means that 1 in 4 men and 1 in 5 women are affected. Many low-income countries currently face the so called 'double burden of disease' where they are challenged with both the burden of infectious diseases such as HIV and malaria, but also the NCD's such as hypertension and diabetes. Data for hypertension management in LMICs show that current care seeking and management needs improvement.^{2,3} Complications from untreated hypertension are malignant hypertension, stroke, myocardial infarction, kidney problems and heart failure, these are leading to high mortality rates.^{4,5}

Hypertension in Sierra Leone

Sierra Leone is a low-income country (LIC) in Western Africa hosting 8 million people, with an average life expectancy of 59 years.⁶ Its health system was disrupted by several years of civil wars and the Ebola outbreak in 2014. In Sierra Leone studies have shown there is a high prevalence of hypertension.^{7,8,9} The major challenges found in hypertension management are both health system factors as well as patient related factors.^{7,10} On the health system poor early detection and management of hypertension are reported. Adequacy of health care workers in cardiovascular risk management including hypertension management, availability of blood pressure machines, availability of antihypertensives were main concerns on the health system side.¹⁰

On the patient side poor health literacy of community members leads to poor awareness on cardiovascular risks.³ Especially in Sierra Leone where diets include high salt and oil intake.^{11,12} Studies have shown how these dietary habits influence hypertension in West Africa.¹³ Delayed care seeking behaviour due to asymptomatic presentation, low health literacy, financial constraints and different beliefs are reported to be

the main challenges.³ Nevertheless, when diagnosed, adherence to prescribed treatment

remains another challenge.¹⁴ Both these health system and patient related factors lead to high morbidity and mortality.^{7,3} Cohort studies conducted in Sierra Leone assessing stroke patients showed an incidence of 68% - 84.3% of hypertension.^{5,15,16} Another study showed high prevalence of hypertension in a cohort of patients with chronic kidney disease.¹⁷

Challenges in early diagnosis and treatment

Studies have shown how the poor awareness amongst both patients and health care workers.¹⁸ Low health literacy of hypertension amongst community members leads to delayed care seeking and poor adherence to prescribed therapy.³ Hypertension usually does not present with symptoms until advanced stages which makes early diagnosis and treatment difficult. Many people never get diagnosed or when they do, access to treatment and blood pressure control is poor.⁷ Even when diagnosed, access to care continues to remain challenging due to both health system factors as well as personal and community perceptions and beliefs leading to delayed care seeking.³ Finally when patients are diagnosed and received medication, compliance can be an issue due to either the above mentioned beliefs and financial constraints.¹⁴ Hypertension medication is not part of the free health care system and therefore people face challenges affording treatment. A study conducted in Sierra Leone's capital Freetown showed how 56% of patients used herbal medicine instead of the regular medication, figures might even be higher in rural areas.¹⁹

This study is a baseline study aiming to provide an overview of the current prevalence and management of hypertension in the surroundings of Lion Heart Medical Center, Yele, Tonkolili district in Sierra Leone, prior to an intervention study.

MATERIALS AND METHODS:

Study setting and design

From February till April 2022, a prospective baseline study was conducted in 5 Peripheral

Health Units (PHUs) within the catchment area of Lion Heart Medical Centre (LHMC), Yele, Tonkolili District, Sierra Leone. The aimed sample size was 100 patients. PHUs are health facilities that provide basic medical care such as malaria, HIV and common childhood illnesses management. PHUs also provide maternity care and conduct uncomplicated deliveries. There are different types of PHUs; Community health centers (CHC) are relatively bigger PHUs and are usually staffed by a Community Health Officer (CHO) as incharge, a midwife, one or two state enrolled community health nurses (SECHN) and a maternal child health aid (MCH aid). The CHCs supervise the activities of smaller PHUs: the Community Health Posts (CHPs) and the Maternal and Child Health Post (MCHP). The CHCs are generally located in the chiefdom headquarter towns and in some areas of big

Characteristics	N (X%)
Health facilities	
Yele	20 (18%)
Kenema Blango	27 (24%)
Mansumana	25 (22%)
Ngolahun Jabati	18 (16%)
Yebe	22 (20%)
Number of patients with unknown hypertension	38 (33%)
Females	86 (73%)
Age (Median and IQR)	59 (39-70)
Number of patients with malignant hypertension	4 (3.5%)
Females	2 (50%)
Age (Median and IQR)	80 (48-80)
Number of patients with systolic blood pressure > 180 mmHg and diastolic <120 mmHg	10 (15%)
Females	8 (80%)
Age (Median and IQR)	55 (48 – 75)
Number of patients with unknown hypertension, age > 40 years	28 (49%)
Number of patients with unknown hypertension, < 40 years	10 (18%)

towns. CHPs and MCHPs are staffed by a community health assistant (CHA), a SECHN or SRN and one MCH aid. The in charge is either a CHA or an SRN.

The CHO program is a higher national diploma program with the duration of 3 years training in basic health care themes. The CHA program is an ordinary diploma program. The SECHN training is the national training for nurses and is an ordinary national diploma program. SRN is a higher national diploma program.

An MCH aid is a certificate program and only allows to work under supervision of a CHO, CHA, midwife, SRN or SECHN.²⁰

LHMC is a referral center withing Gbonkolenken Chiefdom, it is an NGO hospital with OPD services and 70 beds for inpatient care.²¹

Weekly, a team from LHMC visits one PHU facility for outreach purposes. In total 20 PHU facilities are part of the LHMC catchment area.

Definitions

Hypertension: a blood pressure reading systolic above 140 mmHg and, or, diastolic above 90 mmHg, measured on two different occasions with an interval of at least 5 minutes.

Malignant hypertension: a blood pressure systolic above 180 mmHg and, or, diastolic above 120 mmHg.

Data collection and analysis

During the visit to the PHU of the LHMC outreach team, in addition to normal outreach activities, the team measured the blood pressure of the attendees of the outreach meeting. All measurements were documented on data collection forms. All data were anonymized. (See appendix A for data collection form).

Secondly, the PHU staff was asked to participate in a short questionnaire assessing current hypertension management in the facility. (See appendix C)

During the study period data were collected on hypertension cases presenting at LHMC OPD and malignant hypertension cases admitted for in-patient management at LHMC.

Data management and analysis were performed using both Excel for windows and SPSS, version 26. Frequency distributions, medians, means, and standard deviations were calculated. The relationship between hypertension and patient characteristics was evaluated by the chi-squared test and Fisher's exact test. A P-value of less than 0.05 was considered statistically significant.

RESULTS

Prevalence hypertension in PHU population

A total number of 112 patients were included in the study. Five different PHU facilities were visited: Kenema Blango (N=27), Mansumana (N=25), Ngolahun Jabaty (N=18), Yele (N=20), Yebe (N=22). Eighty-six were female which accounted for 76% of the sample. Median age and IQR of the sample was 40 (25-59). In total 38

(33%) patients had hypertension and 4 (3.5%) patients had malignant hypertension. (Table 1). Age above 40 years of age was significantly associated with hypertension ($P < 0.001$). Sex was not significantly associated with hypertension. Both age above 40 years and sex were not significantly associated with malignant hypertension.

Table 1: Patient characteristics for hypertension and malignant hypertension

Current management of hypertension in PHUs. Mansumana and Yeben both are MCHPs. Kenema Blango and Yele are both CHCs. Ngolahun Jabaty is a CHP. Upon the interview with the health care worker in-charge of all five PHU facilities only one of the facilities had a working BP machine. With regard to the question in which patients measuring the BP was considered, one in-charge indicated they would measure the BP in every patient if a BP machine was available. Measuring the blood pressure (if a BP machine was available) in the four other facilities was mainly considered in pregnant women or symptomatic non-pregnant patients with symptoms such as headache, stroke, blurry vision. During the interview the in-charges were asked which patients they would consider treating for hypertension if medication was available. All in charges indicated they considered treating pregnancy induced hypertension. The PHUs that did not have a BP machine available would treat based on symptoms. Symptoms considered treating for pregnancy induced hypertension were headache and dizziness. The medication available for hypertension was methyldopa in four facilities, one facility did not have any antihypertensive medication.

Current hypertension cases in outpatient and inpatient in LHMC

Retrospective analysis of OPD records showed only small numbers of hypertension cases presented at LHMC. A total of 21 cases in January 2022 represented 4% of the total OPD visits in patients above 5 years of age. A similar number was found in February 2022 20 cases accounting for 4.5% of the visits.

During the study period the LHMC hospital records showed 8 cases with malignant hypertension admitted for inpatient management.

Of those 8 patients, 7 had a CVA secondary to malignant hypertension on admission. All these cases were females. All managed according to local LHMC protocol: initiated on hydrochlorthiazide and nifedipine. When initial management was failing hydralazine IV was initiated. Five of those eight patients died after a stroke due to malignant hypertension.

DISCUSSION

This study showed that prevalence of hypertension was high in our sampled cohort at five PHU facilities near LHMC, Yele. The average overall prevalence of 33% is higher than the average of 22% recorded in another study in Sierra Leone conducted in 2021.⁷ However, the WHO reports a prevalence of hypertension of 35% in Sierra Leone which is similar to our findings.³ One of the possible causes for our percentage to be higher is the use of only one size BP cuff which could have led to high measurement in obese patients. Furthermore, good instructing of the patient to relax the arm during measurement was sometimes a challenge. When comparing these data to other West-African countries we find similar figures. Studies for example conducted in Nigeria, Benin, Gambia, Ghana and Bissau show hypertension prevalence rates ranging from 26.9 - 44.8%^{22,23,24,25,26}

The other main finding of this study are the challenges identified in current management of hypertension in the PHU facilities. As only 20% of the visited PHUs had a BP machine and none of the facilities had antihypertensive medication available, early diagnosis and treatment was difficult. The only available medication was methyldopa which is mainly advised to be used in pregnant women.²⁷ Witter et al describes poor equipment in primary care facilities as one of the challenges in delivering non communicable disease management in fragile settings such as in Sierra Leone.¹⁰

Another concerning finding in this study was the current practices in facilities without working BP machines symptom-based treatment. This practice can be very dangerous as for example treating people with antihypertensives when they

present with dizziness without measuring the BP. Dizziness can easily be mistaken for other diagnosis such as hypotension or anaemia. In the first case, administration of antihypertensive drugs can harm the patient. This study has two major limitations. The first limitation being the low sample size of the study. However, despite this study only taking place in one area within Tonkolini District of Sierra Leone, combined with data from other studies the high prevalence seems realistic and therefore provides reasons for intervention in the outreach facilities of LHMC. Another limitation to this study includes the unequal distribution of men and women in the sample size. Although this study was an open access study, more women presented at the PHUs than men. This led to sample size bias. Women are more likely to be seen in the health facilities as they are usually the ones presenting with their children at the PHU for childhood immunizations or a sick child. Another explanation why the percentage of women was high is the fact that the outreach activities which we used as the opportunity to collect data, is usually better attended by women. Studies however show that prevalence of hypertension among men is supposedly higher, this means that the prevalence measured in our cohort study could be an under estimation.²⁸

Studies addressing challenges in hypertension management in Sierra Leone describe a system approach which both includes training of health care workers as well as assuring a system with availability of medication and support for patients to pay for transport to visit health facilities.^{29,11,30} A call for health insurance as a solution to poor access to hypertension care is proposed by a cross sectional study conducted in both East and West-Africa.³¹

CONCLUSION

This study was a baseline study that showed a high prevalence of hypertension in Yele, Tonkolili District, Sierra Leone. Challenges in current management of hypertension in Peripheral Health Units involved and lacking availability of medical equipment such as blood pressure machines and medication. This contributed to symptomatic treatment and poor referral practices. All

hypertension cases found in the study were not aware of their condition and therefore it can be assumed that awareness of hypertension is low.

RECOMMENDATIONS

This study provided an overview of the current practice and areas for intervention in PHUs near Lion Heart Medical Center. Areas for intervention are to improve awareness amongst health care workers and the communities on hypertension as many of the hypertensive cases we found in the study were not aware of their condition. Secondly, adequate supply of blood pressure machines and antihypertensive medication should be an intervention to improve early detection of hypertension.

ETHICAL CONSIDERATIONS

As this baseline study does not collect patient details and all data were anonymized, therefore there is no need for ethical committee review. Patients with high blood pressure will be referred to nearby health centres for follow up. Patients with malignant hypertension were referred to LHMC for further management if their nearby health facility was not able to provide management. Interviewed in-charges of PHU facilities gave verbal consent to participate in the questionnaire.

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APPENDIX A: Questionnaire health care worker PHU

Do you have a BP cuff? + what type?

Do you measure BP in every patient?

Do you have medicine for high BP?

Which medicine do you have for high BP?

Which patients would you consider treating for high BP?

Do you refer patients for high BP?

Which patients would you refer for high BP?

How often do you refer patients for high BP?