
PREVALENCE OF HYPERTENSION AND ITS PHYSIOLOGICAL RISK FACTORS IN WOMEN OF REPRODUCTIVE AGE AT MERU COUNTY

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Abstract

Introduction: Women of reproductive age have relatively low rates of hypertension. However, hypertension in this group present major clinical implications not only because it's a key risk factor for cardiovascular disease but the challenges it poses during pregnancy and the impact on both maternal and foetal outcomes. This study aimed at determining the prevalence of hypertension and identifying its physiological risk factors among women of reproductive age at Meru County, with a purpose of laying ground work for surveillance and intervention.

Methods: A cross-sectional descriptive design was adopted for this study. Anthropometric measurements, blood sample collection, and Blood Pressure (BP) measurements were carried out among 355 women of reproductive age. Regression analysis and descriptive statistics were utilized in data analysis.

Results: The prevalence of hypertension was 11.55% (n=41) and the physiological risk factors included age, family history of hypertension, increased Body Mass Index (BMI), higher waist circumference, central obesity, elevated triglycerides, low High-Density Lipoproteins (HDLs) and metabolic syndrome presence.

Conclusions and recommendations: This study concludes that the prevalence of hypertension among women of reproductive age in Meru County was relatively low though a bit higher compared to the 2014 demographic health survey estimates. Women of reproductive age should adopt primary prevention strategies to mitigate the modifiable risk factors that predispose them to development of pre-hypertension.

Key words: Prevalence, Hypertension, Women of reproductive age, Central obesity, BMI

Introduction

Over the past decade, global health has experienced a shift in the burden of diseases from communicable to Non-Communicable Diseases (NCDs) (World Health Organization, 2010). NCDs are receiving global attention with the World Health Assembly adopting a global target of “25 by 25” for a 25% reduction in premature mortalities from NCDs by the year 2025 (Marquez & Farrington, 2013). NCDs are the leading causes of deaths in the world responsible for 36 million (63%) mortalities in the year 2008. Out of this, nearly 29 million (80%) mortalities occurred in low and middle-income countries (WHO, 2010 & WHO, 2011). NCDs include cardiovascular diseases (hypertension, coronary heart disease), diabetes, cancers, obesity and chronic respiratory diseases (Emami, 2013). Unfortunately, according to Marques and Farrington (2013) half of the mortalities from NCDs occur in people under 70 years of age in African countries.

Hypertension is the single most important cause of Cardiovascular Disease (CVD) morbidity and mortality in the world, especially in low- and middle-income countries where there is a rise in prevalence partly due to urbanization and changes in lifestyle (WHO, 2010). Hypertension is an important public health problem that is asymptomatic and diagnosed incidentally or after a major organ failure has occurred. As a result, the burden of hypertension is under reported especially in the developing countries (Gudina, Yadani, & Assegid, 2013). Limited data on the trends of prevalence of hypertension suggest that it

has increased in economically developing countries in recent years while it remained stable or decreased in developed countries. Thus, most of the world's hypertensive people live in developing countries, where the cardiovascular disease has an early onset and higher mortality than in developed countries (Tesfaye, Byass, & Wall, 2009). It is worth noting that hypertension is the most important modifiable cardiovascular risk factor (Zhang & Li, 2011).

Women of reproductive age have relatively low rates of hypertension (Bateman et al., 2012). However, hypertension in this group presents major clinical implications because it is a major risk factor for cardiovascular disease and also it poses health challenges during pregnancy and impacts on both the maternal and fetal outcomes (Marquez & Farrington, 2013; Robbin et al., 2011). The current age standardized hypertension prevalence among women in Kenya is 33% (WHO, 2013). The current demographic survey indicates that 9% of women of reproductive age had been diagnosed with hypertension with women in urban areas being affected more than those in rural areas (Kenya Demographic Health Survey, 2014). Physiological risk factors such as older age, higher BMI, central obesity, diabetes mellitus and high total cholesterol levels are key to the development of hypertension (Zaw, Latt, Aung, Thwin, & Myint, 2011). Therefore, understanding the prevalence of hypertension and its physiological risk factors among women of reproductive age is crucial for targeted public health interventions to improve pregnancy outcomes, prevent cardiovascular diseases and improve maternal and fetal outcomes.

Methods

A cross sectional descriptive study design was utilized. The study respondents were 355 women of reproductive age (15-49 years) in Meru County.

There were three components in data collection including taking anthropometric measurements such as weight, height and waist circumference. The height and weight were measured using a digital scale that has a height attachment and the two parameters were used to compute the BMI as weight in KGS/height in (M) 2. Waist circumference was measured using a tape with an average of three measurements and woman with a waist circumference of $\geq 80\text{Cm}$ (≥ 35 inches) were considered to have central/abdominal obesity.

The second component involved measurement of BP. Blood pressure reading was categorized as normal blood pressure which is $\leq 120/80\text{mmHg}$, hypertension as

$\geq 140\text{ mmHg} / 90\text{ mmHg}$ and pre-hypertension which is blood pressure readings between $121/81\text{ mmHg}$ and $139/89\text{ mmHg}$ (National Institute of Health, 2000).

The last component was obtaining a blood sample for lipid profiles and blood glucose analysis. Descriptive statistics and multivariate logical regression analysis were utilized.

Results

The age of the study respondents ranged from 15 to 49 years with a mean age of 27.54 years (SD 7.05) where the majority of the respondents 30.70% (n=109) were aged 25-29 years old. It was established that the prevalence of hypertension in this group was 11.55% (n=41), prehypertension was 36.62% (n=130) while more than half 51.83% (n= 184) of the respondents had normal blood pressure readings.

The table 1 below elaborates more findings.

Table I: Physiological factors of hypertension among women of reproductive age

Risk factors	n	%	Odds Ratio (OR)	P value	95% CI
Age in years					
15-34	30	73.17	2.91	0.02	0.58-16.24
35-49	11	26.83			
Family history of hypertension					
Yes	27	65.85	2.08	0.04	0.13- 31.42
No	14	34.15			
Increased BMI					
$\leq 24.9\text{kg/M}^2$	11	73.17	3.78	<0.01	0.05- 67.47
$\geq 25\text{Kg/M}^2$	30	26.83			
Increase in Waist circumference					
≤ 34.9 inches	07	17.07	3.83	<0.01	0.84- 23.589
≥ 35 Inches	34	82.93			
Central obesity					
Yes	34	82.93	3.24	0.02	0.01- 30.23
No	07	17.07			
Total cholesterol					
Normal <5.19	35	85.37	0.78	0.57	0.11-41.02
Abnormal ≥ 5.20	06	14.63			
Triglycerides					
Normal <1.69	04	11.55	2.11	0.01	0.15- 32.37
Abnormal ≥ 1.70	37	90.24			
HDL					
Normal ≥ 1.36	08	19.51	2.30	0.04	0.13 - 31.42
Abnormal ≤ 1.35	33	80.49			
LDL					
Normal <3.36	39	95.12	0.80	0.63	0.01- 42.24
Abnormal ≥ 3.37	02	04.88			
Metabolic syndrome					
Present	37	90.24	2.08	0.03	0.13- 31.42
Absent	04	09.76			

Discussion

The prevalence of hypertension in this study population was low at 11.55% which is close to that of a similar study conducted in the United States among women of reproductive age that estimated hypertension prevalence at 7.7% (Bateman et al., 2012). Similarly, the current demographic health survey indicates that 9% of women of reproductive age had been diagnosed with (KDHS, 2014). These results also concur with those of a Vietnamese study that found a prevalence of 15.7% (Do, Geleijnse, Le, Kok, & Feskens, 2015). It is worth noting that the WHO statistics estimate that the age standardized hypertension prevalence for women in Kenya to be 33% (WHO, 2013) which is higher than the results of this study.

This huge difference could be as a result of the age limits of the study respondents whereby the WHO included all women 15 years and above and this study was limited to 15-49 years. Other studies have found higher prevalence of hypertension among women of reproductive age for example 24.7% was found among the Chinese women (Deng et al., 2013); 33.3% among Zambian women (Goma, et al., 2011); 28.9% among Ethiopian women (Tesfaye, Byass, & Wall, 2009), and 28.0% among Ghanaian women (Cappuccio et al., 2004). These differences in prevalence may be as a result of differences in nutrition, lifestyle and the sociocultural factors in the study populations of different geographical locations.

Among the physiological factors analyzed, younger age was found to be a significant

risk factor where those below 35 years were found to have almost a threefold (OR 2.91) risk of developing hypertension compared to those above 35 years of age. These results are contrary to those of Hwang et al., (2013), Zaw et al., (2011), Cappuccio et al., (2004), WHO (2013), Kishore et al., (2016), Goma et al., (2011), Kayima et al., (2015), Pires et al., (2013) and Do et al., (2015) who found older age to be a significant risk factor for development of hypertension. This difference in results could be as a result of differences in the study populations where this study included only women up to 49 years and most of the women were young aged between 25-29 years.

A positive family history of hypertension was also found to be a positive predictor of hypertension in this group with an odds ratio of 2.08 which is similar to the findings of Hwang et al., (2013), Howteerakul, Suwannapong, Sittilerd, & Rawdaree., (2006), Wei et al., (2015) and Wang et al., (2009). In addition, Guanglin et al., (2001) retaliate that history of hypertension in first degree relatives (parents and siblings) is a risk factor for the development of hypertension. This study found that most respondents had a parent who was hypertensive.

Increased BMI was found to have almost a fourfold (OR 3.78) risk for development of hypertension in this group. these findings concur with results of Wang et al., (2015), Viigimaa, et al., (2014), Sun et al., (2010), Bateman et al., (2012), Howteerakul et al., (2006), Pires et al., (2013) and Gupta et al., (2013) who have documented that excess weight indicated by increase in BMI is

associated with higher risk of hypertension. In fact, a Chinese study indicated that increase in BMI was a positive predictor of hypertension in women (Wang et al., 2009). Goma et al., (2011) also found increased BMI to be a significant risk factor for hypertension among the Zambian women population. Similarly, raised BMI was also associated with an increased risk for development of hypertension among the Ethiopian population (Abebe, Berhane, Worku, & Getachew, 2015). Waist circumference is a good predictor of overweight and obesity with the cutoff points for women being ≥ 35 inches. This study found that women who had a higher waist circumference of ≥ 35 inches had a threefold (OR 3.83) risk of developing hypertension compared to those who had lower waist circumference. Similar findings have been found by WHO (2010), Wang et al., (2009) and Viigimaa et al., (2014).

This study has established that the women who had central obesity had a threefold (OR 3.24) risk of development of hypertension compared to those who did not have central obesity. This concurs with WHO (2013), WHO (2010), and Hwang et al., (2013) who associated obesity with hypertension. In addition, central obesity was established to be independently associated with hypertension in the USA (Osthega, Hughes, Terry, Fakhouri, & Miller, 2012); in China (Wei et al., 2015) and Uganda (Kayima et al., 2015). Metabolic syndrome was found to be a positive predictor of hypertension with a twofold (OR 2.08) risk which concurs with the findings of Gupta et al., (2013). Additionally, a Spain study established that those with metabolic

syndrome had higher incidences of hypertension (Cordero et al., 2006).

Analysis of the lipid profiles indicated that raised triglycerides and reduced HDL were statistically significant risk factors for hypertension with OR 1.50 and 2.30 respectively which concur with an Estonian study that showed reduced HDL and raised triglycerides levels were significant in the prediction of hypertension (Viigimaa et al., 2014). Similarly, in India, reduced HDL and elevated triglycerides were found to contribute to the development of hypertension (Gupta et al., 2013). Elevated total cholesterol levels and high LDLs were not significant risk factors in this study population contrary to Delhi and Indian studies that found raised total cholesterol levels to be important independent risk factors (Gupta et al., 2013 & Kishore et al., 2016)). Further, this differs with WHO (2013) which found high cholesterol to be a risk factor for hypertension in female populations. This difference could be as a result of differences in nutrition habits and environmental factors.

Conclusion and Recommendations

Hypertension is an important public health problem and it is the single most important modifiable risk factor that causes CVD mortalities and morbidities in the world. This study concludes that the women of reproductive age in Meru County had a low prevalence of hypertension though compared to the 2014 demographic health survey estimates; this prevalence is a bit higher.

The physiological risk factors associated with the development of hypertension among women of reproductive age in Meru country include younger age, positive family history of hypertension, higher BMI, higher waist circumference, central obesity, raised triglycerides and reduced HDL and presence of metabolic syndrome.

Hypertension has major public health and clinical implications, therefore, women of reproductive age must be healthy educated about the physiological risk factors that contribute to the development of hypertension in order for them to institute preventive interventions. In addition, there is a need for the development of risk factor surveillance tool and model for screening of women.

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