Obesity and Hypertension Prevalence in Nurses in a Tertiary Health Institution in Cameroon

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Abstract
The aim of the study was to investigate the prevalence of obesity and hypertension in female nurses working in St. Elizabeth Catholic general Hospital.

Case 1
Patients and methods
The cross-sectional study was carried out in the medical outpatient department of the St. Elizabeth Catholic General hospital Shisong, Cardiac centre. 108 female nurses were recruited into the study. Following informed verbal consent, and after the patient had been seated for at least 10 minutes, a trained nurse took blood pressure and anthropometric measurements. Hypertension was defined according to their commendations of the JNC 7.

Results
77 patients presented themselves, aged between 37 and 92 years old, giving a mean of 54 ± 13 years old. The mean systolic, diastolic blood pressure, height, weight, BMI and waist circumference of the ladies were 138 ± 22.7 mmHg, 83 ± 14 mmHg, 158.5 ± 7 cm, 70 ± 13.7 kg, 27.7 ± 5 and 88 ± 10 cm respectively. According to the JNC classification of HTN, normal blood pressure was seen in 30% of the population with a mean blood pressure of 110, 5 ± 6 and 63.6 ± 6.5 mmHg. Pre-hypertensive was 41.4% of the population with a reading of 128 ± 6 and 73 ± 10 mmHg. Hypertension stage I and II were diagnosed in 13% and 15.6% respectively with the following figures: 150 ± 6 and 81 ± 9, and 181.8 ± 16 and 87 ± 15 mmHg. 92% attended only primary school and 8% had no education. The BMI was normal with the mean being 22 ± 1.74 kg/m² in 27%. The overweight were representing 35% of the population with a mean BMI – 26.8 ± 1.4 mmHg. Moderate obesity was represented in 23.2% of ladies with a mean BMI – 31.4 ± 1.5 kg/m². Severe obesity was diagnosed in 14.8% patients with a mean BMI – 36.3 ± 1.3 kg/m². According to the waist circumference, overweighted ladies were representing 31.2%, the figure being – 83 ± 2.2 cm.

Conclusion
The prevalence of hypertension and obesity in female nurses in the grass field high altitude area is high. Our findings confirm the growing public health challenge of Non Communicable Diseases like hypertension as a public health problem in rural Cameroon. There is an urgent need for preventive strategies on hypertension and obesity control in this area.

Non-communicable diseases (NCDs) have become a major public health concern worldwide and their dramatic growth has become a serious healthcare burden in recent decades [1]. NCDs have become more prevalent in developing countries, where they cause double burden as infectious diseases [2]. Hypertension, a major health concern among NCDs, is a leading cause of cardiovascular disease and a primary cause of stroke, coronary heart disease, heart failure, kidney disease, and blindness [3]. In Cameroon, surveys on hypertension report prevalence varying from 12 to 22% in those above 25 years [4].

Between 1994 and 2003, there was a rightward shift of cumulative distribution curves of systolic and diastolic blood pressures, and the prevalence of hypertension increased by 2- to 5-fold in rural and urban Cameroonian men and women [5]. In 2003, a large survey of adults aged ≥ 15 years in four main Cameroonian towns (Yaoundé, Douala, Garoua and Bamenda), found that more than 25% of urban men and almost half of urban women were either overweight or obese, with 6.5% of men and 19.5% of women being obese [6]. Several epidemiological studies have shown that, blood pressure (BP) is strongly related to body weight and that control of obesity is a critical component of prevention and control of hypertension [7]. However, little attention has been given to farmers in rural areas. The aim of the study was to investigate the prevalence of obesity and hypertension in female farmers living in a grassfield rural area of Cameroon.

Case 2
Patients and methods
Study population and measurements: The cross-sectional study was carried out in the medical outpatient department of the St. Elizabeth Catholic General hospital Shisong, Cardiac centre. 77 female farmers were recruited into the study. The control group consisted of 24 housewives. Following informed verbal consent, and after the patient had been seated for at least 10 minutes, a trained nurse took blood pressure and anthropometric measurements. Abnormal measurements were repeated after a further 30-minute rest, and the lower measurement was recorded on the questionnaire. Systolic (first-phase) and diastolic (fifth-phase) blood pressure were measured with a mercury sphygmomanometer with appropriately sized cuffs. Anthropometric measurements were taken, following standard protocol, with patients in light clothing and no shoes. Body weight was measured to the nearest 0.1 kilogram (kg). Height was measured to the nearest centimetre (cm) with the patient in the upright position. Body mass index (BMI) was computed as weight (in kg) divided by the square of the height (in metres).

Case definitions: Hypertension was defined according to the...
recommendations of the JNC 7 as systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg. Isolated systolic hypertension was defined as systolic blood pressure ≥ 140 mmHg and diastolic blood pressure < 90 mmHg; isolated diastolic hypertension was diastolic blood pressure ≥ 90 mmHg and systolic blood pressure < 140 mmHg Guidelines Subcommittee [8]. A BMI of less than 25 kg/m² was considered normal, 25 to 30 kg/m² was overweight, and that above 30 kg/m², obese [9].

Statistical analysis

Data were collected and analyzed by the Epi Info statistical software, version 6.04 (Centers for Disease Control, Atlanta, Georgia, USA). Values were expressed as percentages for proportions, and the “mean” (standard deviations) for continuous variables. Probabilities of significant differences were compared by the chi-square test (for proportions) and one-way analyses of variances or the Kruskall-Wallis test, as appropriate (for quantitative variables). Unadjusted logistic regression analyses were carried out to investigate which of possible risk factors were associated with hypertension. Multiple logistic regression analyses were then carried out to find out which of the factors were independently associated with hypertension.

Results

77 patients presented themselves, aged between 37 and 92 years old, giving a mean of 54 ± 13 years old. The mean systolic, diastolic blood pressure, height, weight, BMI and waist circumference of the ladies were 138 ± 22.7mmHg, 83 ± 14 mmHg, 158.5 ± 7 cm, 70 ± 13.7 kg, 27.7 ± 5 and 88 ± 10cm respectively. According to the JNC classification of HTN, normal blood pressure was seen in 30% of the population with a mean blood pressure of 110, 5 ± 6 and 63.6 ± 6.5 mmHg. Pre-hypertensive was 41.4 % of the population with a reading of 128 ± 6 and 73 ± 10 mmHg. Hypertension stage I and II were diagnosed in 3% and 15.6% respectively with the following figures: 138 ± 22.7mmHg, 83 ± 14 mmHg, 158.5 ± 7 cm, 70 ± 13.7 kg, 27.7 ± 5 and 88 ± 10cm respectively. The prevalence of hypertension was based on three measurements of blood pressure on one occasion in this study. In clinical practice, a diagnosis of hypertension requires multiple measurements on several occasions. Therefore, the prevalence of hypertension found in our surveys might be an overestimation, although the normal mean heart rate did not support high blood pressure readings due to sympathetic activation. Our study does not allow differentiating between primary and secondary hypertension.

The mean age in the control group was 53 ± 12 years old. The mean systolic, diastolic blood pressure, height, weight, BMI and waist circumference of the housewives 138 ± 24 mmHg, 79 ±13 mmHg, 161 ± 6 cm, 77 ± 15.6 kg, 29.6 ± 6 kg/m² and 93.2 ± 10cm. Housewives were fatter than farmers with a BMI 29.6 ± 6 kg/m² and 27.7 ± 5kg/m² p<0.04 and a waist circumference bigger than farmers; 93.2 ± 10cm and 88 ± 10cm p<0.05 respectively. We didn’t observe any significant difference as far as the age and the systolic and diastolic blood pressures were concerned.

The difference when comparing the DBP was significant with patients aged between 31 –40; 72, 8 ± 8.7 mmHg, and 41 – 50; 76 ± 13 mmHg, p< 0.05.

Discussion

Our study shows that hypertension is no longer rare in Shisong, a rural area of Cameroon with a prevalence of 28.6%. This study shows a huge difference compare to the one done in 2007 showing a prevalence of hypertension in women of the same country in rural area of 11% [10]. The prevalence of hypertension (BP ≥160/95 mm Hg) in rural studies undertaken in the 1970s, 1980s, and 1990s has generally been low: 4.1% in Ghana, 5.9% in Nigeria, 7% in Lesotho, and 4.9% in the rural Zulu, 7.5% in Sudan lower figures than the results of our study [10,11]. But in Uganda, a total of 252 study participants were classified as being hypertensive, giving a crude prevalence of hypertension of 30.4%, almost the same population like in our study [12]. Our findings therefore confirm the growing concern of hypertension as a public health problem in rural Cameroon. In this rural area, house wives were having almost the same blood pressure figures like farmers.

Having a BMI greater than 25 was significantly associated with hypertension, the association being highest in subjects with BMI of 30 or higher, with an adjusted OR of 5.07 [95% CI= 2.79 – 9.21], compared to subjects with BMI less than 25. In Tanzania, Bovet et al found that body mass index was strongly and independently associated with systolic and diastolic blood pressure (1.01 mmHg systolic BP per 1 kg/m² increase in BMI) [13]. In Nigeria, Agymang has also reported an independent association between BMI and BP [14]. Similar results were reported by Onal et al. who found that hypertensive adults aged 25 years or older were twice more likely to be overweight or obese in Istanbul, Turkey [15].

One non-modifiable risk factor was found to be associated with hypertension - the age. In our study ladies aged 60 years or older were more likely to be hypertensive compared to those in the younger age groups. This is consistent with findings from several studies that have reported the risk of hypertension increasing with advancing age; Edwards et al found that hypertensive men and women in rural and urban areas in Tanzania tended to be significantly older compared to those who were not hypertensive [16]. Another study conducted among adults aged at least 20 years in Sousaa, Tunisia, also in Ghana found that hypertension was significantly higher for adults older than 40 years of age [17]. Advancing age increases the risk of exposure to the lifestyle risk factors for hypertension and hence the observed increase in hypertensive risk with aging.

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Conclusion

The prevalence of hypertension and obesity in female nurses in the grass field high altitude area is high. Our findings confirm the growing public health challenge of Non Communicable Diseases like hypertension as a public health problem in rural Cameroon. There is an urgent need for preventive strategies on hypertension and obesity control in this area.
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Conflict of Interest
The study was sponsored by AES Sonel, Bamenda regional representation.

References

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