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Original Research Article

Prevalence of Metabolic Syndrome among Postmenopausal Women Yaounde - Cameroon

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ABSTRACT

Background: Metabolic Syndrome (MetS) is a clinical concept for prediction of further cardiovascular events. Many studies highlighted the increasing prevalence of Metabolic Syndrome after menopause in women.
Objective: The purpose of this study is to assess Metabolic Syndrome prevalence among postmenopausal women who attended a catholic health care center in urban Cameroon (Yaounde) during the month March 2014.
Methods: The population study consists of a total 206 postmenopausal aged between 45 and 65 years. Anthropometric indices, blood pressure, fasting blood glucose and lipid profile were measured. Metabolic Syndrome was evaluated using National Cholesterol Education Program Adult Treatment Panel III 2001 definition.
Results: The overall prevalence of Metabolic Syndrome among postmenopausal women was 16.5%. Among postmenopausal women with metabolic syndrome, the mean of body mass index, waist circumference, systolic blood pressure, diastolic blood pressure, triglyceride and fasting blood glucose levels were significantly high comparatively to postmenopausal women without metabolic syndrome while the mean HDL-cholesterol was significantly low ($P< 0.05$). High blood pressure (30.09%) and Low HDL-cholesterol (27.66%) level were the most frequent characteristics of metabolic syndrome.
Conclusion: Metabolic syndrome is common among postmenopausal women in Yaounde-urban Cameroon.

Key Words: Metabolic Syndrome, Postmenopause, Yaounde (urban Cameroon).

INTRODUCTION

Metabolic Syndrome is described as the clustering of several risk factors such as obesity, hypertension, dyslipideamia, and dysglyceamia that enhanced unexpected arrival of type 2 diabetes and cardiovascular diseases. [1] Many definitions have been scheduled to evaluate this syndrome and the commonly used definition is ATP III definition. [2] Cardiovascular diseases are the leading cause of deaths in both developed and developing nations. [3-6] Many studies show that metabolic syndrome prevalence is enhanced after menopause stage in women. [7-9]

In the climacteric transition, women's synthesis of estrogen decreases, [10] androgenic effects appear such as the redistribution of body fat [11,12] and weight increase. [13] The decrease of estrogen level impair it protective effects on the brain, skin and cardio-circulatory system. [14,15] Prevalence of metabolic syndrome also

differed according the choice on studied population, physical activity level, diet, the chosen definition, the sample size, and ethnic variation. [16] In urban Cameroon population rates of overweight and obesity is higher in women than in men [17] while the physical activity level is low [18] Sufficient information regarding metabolic syndrome studies are lacking in Cameroon [19-22] and no specific study has already focus on metabolic syndrome and menopause. The purpose of this study was to estimated metabolic syndrome prevalence among postmenopausal urban women of Yaounde according to the scheme of National Cholesterol Education Program Adult Treatment Panel III (NCEPATPIII). [2]

MATERIALS AND METHODS

Study design: This cross sectional study was conducted during month of March 2014 because of the activities related to the international women day. Women were invited through media, announcement after mass, in many cultural groups for special cardiovascular diseases free health campaign among postmenopausal women. All the volunteer postmenopausal women were referred to the Holy Spirit Medical Center Mvolye-Yaounde near the minor basilica of Cameroon.

Ethics: The study was approved by the Education Planning Commission of Holy Spirit Medical Center Mvolye-Yaounde. Every woman gave her verbal Informed Consent and the study protocol was executed according to Helsinki Declaration.

Data Collection: Women who had at least 1-year history of cessation of menses, women with no signs of pregnancy, hypertension, type 2 diabetes, cancer, polycystic ovary syndrome, hepatitis B were included for the study. In the registration form open in the health center, a questionnaire was completed for each patient including demographic information, their menopausal status, and health status on hypertension, diabetes and dyslipidaemia, family history and their current medication. Pregnant women, women with past medical history of hysterectomy and those under hormone replacement therapy were not included for the study.

Anthropometry: The height of the informants was measured in standing position using a tape meter while the shoulder was in a normal position to the nearest millimetre (Siber Hegner, Zurich, switzerland). Body weight and body fat were determined in 12-h fasted participants (with very light clothing on and without shoes). Waist circumference was taken with the subject in a standing position, to the nearest millimetre, using a non-stretchable tape measure at the midpoint between the lowest rib and the iliac crest in expiration.

Physiological measurements: Systolic and diastolic blood pressures were measured in a resting sitting position using a mercury sphygmomanometer. An appropriate adult cuff was applied 2 to 3 cm above the antecubital fossa of the right arm. The blood pressure was measured on the right hand to the nearest 2mmHg, reading the calibration below the meniscus. Systolic and diastolic blood pressures were read at the 1st and 5th Korotkoff phases, respectively. The mean of the 2 blood pressure values obtained was taken as the participant's true blood pressure.

Biochemical analyses of plasma: Fasting venous blood (5ml) was collected between 6:00 and 10:00 am in the laboratory from women and put into heparinised tubes. After centrifugation (3000 rpm *g*) for 10 min, plasma collected within 4 hours of blood collection was immediately stored in aliquots at -80°C, and analysed within one week. Total cholesterol and triglycerides in plasma were measured using previously described standard methods. [23,24] High Density Lipoprotein cholesterol was determined using a heparin manganese precipitation of Apo B-containing

lipoproteins. [25] Fasting capillary blood glucose was determined using glucose test strips (Gluco-touch).

Definition of Metabolic Syndrome: MetS was defined according to the National Cholesterol Education Program Adult Treatment Panel III criteria's. Subjects having three or more of the diagnostic criteria were defined as having MetS according to the NCEP/ATPIII report. [2] These criteria are:

1. Abdominal Obesity: Waist Circumference >88cm,

2. Hypertriglyceridemia: Triglycerides >150 mg/dl,

3. Low High Density Lipoprotein-C < 50 mg/dl,

4. Hypertension: known hypertensive or Systolic Blood Pressure >130mmHg, and or Diastolic Blood Pressure >85 mmHg

5. Dysglycemia: known diabetes mellitus or fasting plasma glucose >110 mg/dl.

Statistical analysis: Data were computerized using the Statistical Package for Social Sciences software, SPSS version 10.1 then transferred to STATA^R 8.2 for analysis. Student's t-test was used to compare mean differences of components by groups of women for quantities values and Chi-square (χ^2) test for quality values. Continuous variables are reported as means ± standard deviations (SD) and categorical variables as percentages. The distribution of continuous variables was assessed by Kolomogrov-Smirnov test and a normal distribution was found prior to statistical analysis. A *p* value less than 0.05 was considered statistically significant.

RESULT

Characteristics of the study population: The data of 206 postmenopausal women were analysed. The general characteristics of the postmenopausal women having or not metabolic syndrome are summarized in Table 1. The mean of year of postmenopausal women without metabolic syndrome is 59.31± 5.19 years while the mean of years of postmenopausal with metabolic syndrome was 57.27± 2.12 years.

Table 1: Antropometric and biological data of postmenopausal women according to their Metabolic Syndrome status

	Postmenopausal without MetS(172)	Postmenopausal with MetS(34)	P value
Age (years)	59.31± 5.19	57.27± 2.12	0.166
BMI, kg/m²	29.36 ± 6.08	31.59 ± 6.58	0.015*
WC, cm	109.94± 14.10	117.10± 12.85	0.000*
SBP, mmHg	124.19 ± 20.30	137.80± 24.52	0.000*
DBP, mmHg	81.76± 16.18	90.80± 17.75	0.000*
FBS, mg/dl	99.10±26.47	103.50± 36.04	0.000*
TG, mg/dl	90.57± 52.92	117.59 ± 81.86	0.000*
T-Chol, mg/dl	139.95± 56.96	135.42 ± 48.95	0.582
HDL-Chol, mg/dl	49.20± 32.13	29.85 ± 16.19	0.000*

* P<0.05 considered significant

BMI: Body mass index, WC: waist circumference, SBP: systolic blood pressure, DBP: diastolic blood pressure, FBS: fasting blood glucose, TG: triglycerides, T-CHOL: total cholesterol and HDL-CHOL: HDL-cholesterol

Postmenopausal women with metabolic syndrome exhibit significantly higher mean of body mass index, waist circumference, systolic blood pressure, diastolic blood pressure, triglyceride and fasting blood glucose levels but lower significant mean of HDL cholesterol low (P< 0.05) in comparison to postmenopausal women without metabolic syndrome. They were no significant differences for the mean of years and total cholesterol between the two groups of women. The prevalence of MetS and its individual components postmenopausal women according to their metabolic syndrome status are highlighted in Table 2. The prevalence of metabolic syndrome among postmenopausal women is 16.50%. We found in sample of study that the most common abnormalities were high blood pressure (30.09%) and low level of HDL-cholesterol (27.66%). High triglycerides level (8.73%), waist circumference (7.76%) and glyceamia (5.33%) were the

less frequent metabolic syndrome components. The results saved in table 3 shows number of subjects according to metabolic syndrome items. It appeared that among postmenopausal women only 13.11% had none of metabolic syndrome component while 36.41%, 33.98%, 14.56% and 1.94% had one, two, three, and four criteria for metabolic syndrome respectively. No postmenopausal women exhibit five altered metabolic syndrome components.

Table 2: Prevalence of the Metabolic Syndrome and its individual components

	Women
Metabolic Syndrome	34 (16.5%)
Hyperglyceamia	11 (5.33%)
Low HDL	57(27.66%)
High Triglycerides	18 (8.73%)
Abdominal obesity	16 (7.76%)
Hypertension	62 (30.09%)

Table 3: Metabolic Syndrome Items

Parameters	Women
0 criteria n (%)	27 (13.11%)
1 criteria n (%)	75 (36.41%)
2 criteria n (%)	70 (33.98%)
3 criteria n (%)	30 (14.56%)
4 criteria n (%)	4 (1.94%)
5 criteria n (%)	0 (0.00%)

DISCUSSION

The aim of this study was to estimate metabolic syndrome prevalence among postmenopausal women in Yaounde, urban Cameroon because no related study already exists. Of the 206 subjects screened, 34(16.5%) were found to have metabolic syndrome. This prevalence is higher than the 6.2% reported in Taiwan [26] and lower comparatively to those previous studies found on metabolic syndrome among postmenopausal women of Congo (20%), [27] China (37.34%), [28] Austria (32.60%), [29] Canada (29.6%), [30] Korea (54.6%) [31] and Tunisia (45.7%). [32] This difference could be attributed to the size of the population study, the use of different Metabolic Syndrome definition, ethnicity, urbanization level, socioeconomic and environmental differences, genetic factors, and lifestyle. [16]

The mean body mass index, waist circumference, hip circumference, systolic blood pressure, diastolic blood pressure, triglyceride and fasting blood glucose levels were significantly high among postmenopausal women with metabolic syndrome while the mean HDL-cholesterol was significantly low ($P< 0.05$) comparatively to postmenopausal women without metabolic syndrome. Our study and the Gorgan [33] study have the same findings except that we did not estimate the LDL-cholesterol.

In Africa diseases related to menopausal status are considered normal and many of these diseases remains undiagnosed and uncontrolled, Hypertension was the most prevalent component of metabolic syndrome, and it is in accordance with the congoleese [27] study. Ethnicity dependent prevalence shows an increase blood pressure among black comparatively to white. [34,35] In our study we found that both systolic and diastolic blood pressure was significant higher among post menopausal women with metabolic syndrome, this finding corroborate the earlier report of Jouyandeh [36] and Marjani [33] and may also suggest that both systolic and diastolic blood pressure are important markers of cardiovascular risk in Cameroon postmenopausal women.

In this study obesity that is generally the commonest disorder associated with women in their menopausal stage [37] is less frequent. It is well known that obesity particularly abdominal obesity is closely associated with many metabolic disorders such as insulin resistance, dyslipideamia, hypertension and diabetes. [38-40] In Africa in general, majority of postmenopausal women are physically active, they are involved in society in many activities such as business, farms, prayer groups, organization of funeral, burial ceremony, wedding, baby sitting of their grandsons. With their old age, they are not easily

influenced by publicity and their nutrition transition level is low they are very conservatives of their traditional eating habits.

Our study shows that triglycerides were significantly high among postmenopausal women with metabolic syndrome this is consistent with these others studies. [38, 39]

A reduced HDL-cholesterol level among postmenopausal women with metabolic syndrome was reported, this is consistent with those studies [41-43] but disagree with these previous ones. [44,45]

A significant difference of high blood fasting glucose was found among postmenopausal women with and without metabolic syndrome in our study, this remark is almost similar with Jouyandeh [36] Study.

Our results show that postmenopausal women had respectively 14.56% and 1.94% of three and four abnormal metabolic syndrome criteria. No women exhibit five altered metabolic syndrome components. Although metabolic syndrome prevalence is low, 86.89% postmenopausal women have at least one metabolic syndrome risk, efficient treatment of Hypertension control should be increased in that group of women.

CONCLUSION

This study shows that metabolic syndrome is common among urban postmenopausal women of Yaounde. Susceptibility to high blood pressure and a reduced HDL-cholesterol level are the most contributing factors. Education and socially adapted preventives measures should be set up to limit the rise of further cardiovascular events. It's clear that this study present several limitations since only the women that have attended the health care centers during the study period were studied and this may not represent the whole tendency in urban Cameroon, so more research is still needed.

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