PREVALENCE OF METABOLIC SYNDROME AMONG TRADERS WOMEN YAOUNDE -CAMEROON

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ABSTRACT

Objective: This study aimed to evaluate metabolic syndrome prevalence among traders women leaving in Yaounde, Cameroon.

Methods: The study was conducted on one hundred and sixteen women aged between 18-60 years who were referred to the Andre Fouda Medical Foundation in Yaounde for international women day celebration. Metabolic syndrome was diagnosed using Adult Treatment Panel-III (ATP-III) 2001 guidelines. Results: The mean of age, body mass index, waist circumference, systolic blood pressure, diastolic blood pressure and fasting blood glucose levels were significantly (P<0.05) higher among traders women with metabolic syndrome. The prevalence of metabolic syndrome among those civil servants women was (39.07%). Low HDL (73.95%), Abdominal obesity (60.47%), High blood pressure (47.44%), high fasting blood glucose (18.60%) and High triglycerides level (17.21%) were respectively the prevalence of metabolic syndrome individual components. 31.16%, 7.440% and 0.47% had three, four and five criteria for metabolic syndrome, respectively. Conclusion: The prevalence of metabolic syndrome is high among civil servants women of Yaounde. Education for chronic diseases prevention among civil servants women should be established in workplace environment.

KEYWORDS: Metabolic Syndrome, Individual Components, Traders Women, Yaounde-Cameroon.

INTRODUCTION

Metabolic syndrome is a public health issue where some risk factors that increases the risk of cardiovascular events and type 2 diabetes clustered.[1,2,3,4] These factors include
dysglycemia, high blood pressure, elevated triglyceride levels, low high-density lipoprotein cholesterol levels (HDL-C), and obesity.\textsuperscript{[5,6]} Its origin is partially understood, but both genetic, life style factors, insulin resistance and pro-inflammatory state play a key role \textsuperscript{[7,8]}. Many metabolic syndrome definitions have been proposed and the commonly working definition was that released by National Cholesterol Education Program in 2001. With the nutritional transition, noticed in developing countries, metabolic syndrome prevalence is increasing at displeasing rate.\textsuperscript{[10,11]} Previous report shows that metabolic syndrome prevalence depends on age, region, urban or rural environment, ethnicity, and the definition of metabolic syndrome used, occupation.\textsuperscript{[12,13]} In Cameroon, available data concerning metabolic syndrome show that it prevalence ranges from the lowest 0.2 \textsuperscript{[14]} to the highest 60\%\textsuperscript{[15]} and limited research is available according occupation.\textsuperscript{[16]} This study aimed to assess the prevalence of metabolic syndrome and its components among trader women of some markets in Yaounde.

**MATERIALS AND METHODS**

Study design: This cross sectional study was conducted during the month of March 2015 and March 2016 because of the activities related to the international women day. Women were invited through media, announcement in the large popular Mokolo market of Yaounde for special chronic diseases free health campaign among women.

Each eligible volunteer traders women were referred to the Medical Foundation Andre Marie Fouda, Yaounde Cameroon for evaluation. Females were excluded from the study if they were pregnant or lactating or under 25 years and women who were not traders. All participants in the study gave her verbal informed consent. The study was approved by the Education Planning Commission of Medical Foundation. All measurements and questionnaire were in accordance with the Helsinki Declaration (1983 version).

**Subjects**

The study team worked in all week days except Sundays of the month of March 2015 and March 2016. The data collection comprised healthcare questionnaire, anthropometric measurement of weight, Height, and abdominal circumference, health examination and laboratory test in fasting state for lipids exclusively.
Height, weight, and waist circumference were all measured using standardized techniques and calibrated equipment. BMI was calculated by dividing weight by height squared (kg/m$^2$) classified according to WHO rules ≥30.[17]

A well trained nurse drew fasting morning blood samples from the examinee’s arm for the lipid. Standardized techniques were used to obtain the blood pressure measurements after at least 10 min of rest.

Waist circumference was taken with the subject in a standing position, to the nearest millimetre, using a non-stretchable tape measure at the mid-point between the lowest rib and the iliac crest in expiration. The height was measured in standing position using 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) using a Tanita™ scale. Fasting venous blood (5 ml) was collected from participants into heparinised tubes between 6:00 and 10:00 am in the laboratory. Total cholesterol and triglycerides in plasma were measured using previously described standard methods.[18,19] High Density Lipoprotein cholesterol was determined using a heparin manganese precipitation of Apo B-containing lipoproteins.[20] Fasting capillary blood glucose was determined using glucose test strips (GlucoPlusTM).

**Definition of Metabolic Syndrome**

Women were considered to have Metabolic Syndrome if they had three or more of the following criteria, according to the ATPIII criteria.[9]

1. Abdominal obesity, defined as a waist circumference in women ≥ 88 cm (35 inch)
2. Hypertriglycerideremia ≥ 150mg/dL (1.7mmol/L) or drug treatment for elevated triglycerides
3. HDL cholesterol level <50 mg/dL (1.3mmol/L) in women or drug treatment for low HDL-C
4. Blood pressure ≥ 130/85 mmHg or drug treatment for elevated blood pressure
5. Fasting plasma glucose (FPG) ≥ 100 mg/dL (5.6mmol/L) or drug treatment for elevated blood glucose

**Statistical analysis**

All data were analyzed by STATA® 8.2. Continuous variables are reported as means ± standard deviations (SD) and categorical variables are presented as percentages. A $p$ value
less than 0.05 was considered statistically significant. Quantitative and qualitative variables were tested using Student’s t-test and the chi-square test respectively. P value <0.05 was considered statistically significant.

RESULTS

Characteristics of the studied traders women
Demographic and clinical characteristics of the trader women are reported in Table 1. Trader women were aged between 18 and 52 years. The mean age of traders women was 30.75 ± 09.89 years and the mean of BMI 30.66 ± 19.38 kg/m². Women with metabolic syndrome exhibit significant higher mean of age, body mass index, waist circumference, systolic blood pressure, diastolic blood pressure and fasting blood glucose comparatively to trader women without metabolic syndrome. The prevalence of metabolic syndrome and its components are reported in table 2. Metabolic syndrome was reported among 46.55% of trader women. The prevalence of individuals components of metabolic syndrome were shown to be (86.21%) for Low HDL, (54.31%) for High blood pressure , 52.59 for Abdominal obesity (60.47%), (30.17%) for high fasting blood glucose and (17.21%) for High triglycerides level among traders women. The three most frequent metabolic syndrome components were Low HDL, High blood pressure and Abdominal obesity respectively. Table 3 shows the presence of zero and one or more components of metabolic syndrome. 2.59% of women presented no metabolic abnormality, we have noticed that 18.10 of women had one metabolic abnormality, 32.76% of women had two metabolic abnormalities, 35.34%, of women had three metabolic abnormalities, 10.34% had four and 0.86% had five criteria for metabolic syndrome.

Table 1: Demographic and clinical characteristics of Trader women (Total, Women with Metabolic Syndrome and Women without Metabolic Syndrome)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Total</th>
<th>Traders women with MetS</th>
<th>Traders women without MetS</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All women, No(%)</td>
<td>116</td>
<td>54</td>
<td>62</td>
<td>-</td>
</tr>
<tr>
<td>Age (years)</td>
<td>30.75 ± 09.89</td>
<td>32.92 ± 9.45</td>
<td>28.74 ± 09.98</td>
<td>0.054*</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>30.66 ± 19.38</td>
<td>32.20 ± 7.81</td>
<td>29.32 ± 5.84</td>
<td>0.025*</td>
</tr>
<tr>
<td>WC, cm</td>
<td>91.91 ± 14.45</td>
<td>96.58 ± 15.55</td>
<td>87.85 ± 12.15</td>
<td>0.001*</td>
</tr>
<tr>
<td>SBP, mmHg</td>
<td>125.26 ± 16.01</td>
<td>131.70 ± 15.15</td>
<td>119.66 ± 14.66</td>
<td>0.000*</td>
</tr>
<tr>
<td>DBP, mmHg</td>
<td>85.06 ± 14.15</td>
<td>92.87 ± 13.64</td>
<td>78.27 ± 10.73</td>
<td>0.000*</td>
</tr>
<tr>
<td>FBS, mg/dl</td>
<td>95.16 ± 49.58</td>
<td>106.46 ± 33.89</td>
<td>85.32 ± 22.84</td>
<td>0.001*</td>
</tr>
<tr>
<td>TG, mg/dl</td>
<td>92.42 ± 30.95</td>
<td>96.16 ± 3.99</td>
<td>89.15 ± 28.51</td>
<td>0.539</td>
</tr>
<tr>
<td>T-Chol, mg/dl</td>
<td>133.60 ± 51.43</td>
<td>134.01 ± 45.59</td>
<td>133.24 ± 56.40</td>
<td>0.936</td>
</tr>
<tr>
<td>HDL-Chol, mg/dl</td>
<td>33.93 ± 11.88</td>
<td>31.51 ± 17.21</td>
<td>36.01 ± 16.02</td>
<td>0.267</td>
</tr>
</tbody>
</table>

*Significant difference between Trader women with MetS and Trader women without MetS

* P value less than 0.05 was considered significant.

Table 2: Prevalence of Metabolic Syndrome and its individual components among Traders women.

<table>
<thead>
<tr>
<th>Metabolic Syndrome</th>
<th>Traders Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyperglycemia</td>
<td>35 (30.17%)</td>
</tr>
<tr>
<td>Low HDL</td>
<td>100 (86.21%)</td>
</tr>
<tr>
<td>High Triglycerides</td>
<td>14 (12.07%)</td>
</tr>
<tr>
<td>Abdominal Obesity</td>
<td>61 (52.59%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>63 (54.31%)</td>
</tr>
</tbody>
</table>

* P<0.05 considered significant

Table 3: Metabolic Syndrome Items.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 criteria n (%)</td>
<td>3 (2.59%)</td>
</tr>
<tr>
<td>1 criteria n (%)</td>
<td>21 (18.10%)</td>
</tr>
<tr>
<td>2 criteria n (%)</td>
<td>38 (32.76%)</td>
</tr>
<tr>
<td>3 criteria n (%)</td>
<td>41 (35.34%)</td>
</tr>
<tr>
<td>4 criteria n (%)</td>
<td>12 (10.34%)</td>
</tr>
<tr>
<td>5 criteria n (%)</td>
<td>1 (0.86%)</td>
</tr>
</tbody>
</table>

DISCUSSION

Cardiovascular diseases are the primary outcomes of metabolic syndrome. The worldwide metabolic syndrome prevalence is increasing including Cameroon. Reports show that metabolic syndrome changes according to occupational type. Little is known among metabolic syndrome studies according to occupation in Cameroon, the existing study has already focus on metabolic syndrome among health worker, therefore, this is the first study related to evaluate metabolic syndrome prevalence among trader women in Yaounde. The finding of this research indicates the presence of metabolic syndrome among 46.55% trader women. This metabolic syndrome prevalence is high than that reported among previous metabolic syndrome women studies in Cameroon.

The comparison of our findings with another studies are limited because of the few available data concerned metabolic syndrome individual components prevalence from traders populations in Africa as. The most frequent abnormalities were Low HDL cholesterol, High
blood pressure and Abdominal obesity respectively. The high prevalence of Low HDL cholesterol in our study is in accordance with previous studies, Turkish\textsuperscript{[26]}, Canadian\textsuperscript{[27]}, Bambilék\textsuperscript{[22]} studies also shows that low HDL cholesterol is the most common found risk factor in women having metabolic syndrome.

The high prevalence of hypertension and obesity among these trader population is similar to trend reported among traders of Sokoto market in Nigeria.\textsuperscript{[28]} The frequency of metabolic syndrome was highest in the study, although the genetic aspects of metabolic syndrome is quite important, several studies have revealed that lifestyle change also play a important role, in general. The list of factors that could justified the metabolic syndrome prevalence are, ignorance, unhealthy attitudes, low physical activity\textsuperscript{[29,30]}, environmental factors, such as working hours, sociocultural factors, as nibbling, food overconsumption, physiological changes.\textsuperscript{[31]}

Physical inactivity is well recognized among Cameroon\textsuperscript{[29]} women and worldwide\textsuperscript{[30]} to be a contributing factor for chronic diseases

In the study, MetS women were older and had higher BMI, mean systolic BP, and fasting plasma glucose. A constant finding in the prevalence of MetS is age dependence, with various studies showing a positive correlation between age increase and incidence of MetS.

This study has some major limitations, the small sample size of population recruited only in Yaounde and it cross-sectional nature prevents it to be generalized in all traders women.

**CONCLUSION**

Metabolic syndrome prevalence is high among traders women of Yaounde. Low HDL Cholesterol, abdominal obesity and high blood pressure are the most frequent individual components. Government should take measures for health promotion at markets.

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**Declaration of Conflicting Interest**

The authors declare that there are no conflicts of interest.
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