PREVALENCE OF METABOLIC SYNDROME AMONG CIVIL SERVANTS WOMEN YAOUNDE –CAMEROON

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ABSTRACT

Objective: This study aimed to evaluate metabolic syndrome prevalence among some civil servants women leaving in Yaoundé, Cameroon. Methods: The study was conducted on two hundred and fifteen women aged between 18-60 years who were referred to the Andre Fouda Medical Fundation in Yaoundé for international women day celebration. Metabolic syndrome was diagnosed using Adult Treatment Panel-III (ATP-III) 2001 guidelines. Results: Except for HDL Cholesterol, the mean of age, body mass index, high fasting blood glucose, triglycerides levels and total cholesterol levels were significantly (P<0.05) higher in civil servants 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 establish in workplace environment.

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

INTRODUCTION

Metabolic syndrome is the cluster of risk factors that increases the risk of cardiovascular disease and type 2 diabetes[1,2] These factors include dysglycemia, high blood pressure,
elevated triglyceride levels, low high-density lipoprotein cholesterol levels (HDL-C) and obesity.\cite{3,4} Its origin is still little understood but both genetic, environmental factors, insulin resistance and pro-inflammatory state play a key role.\cite{5,6} Many metabolic syndrome definitions.\cite{7,8,9} have been set up for diagnostic matter but imperturbably the epidemic is growing fastly around the world and developing countries are not prepared to face the dramatic consequences. With education facilities, many women have access to work with regular income, they spent many hours at work place in sedentarily position and are in contact with unhealthy food for their nutrition. Studies have shown worldwide prevalence of metabolic syndrome depends on age, region, urban or rural environment, ethnicity and the definition of metabolic syndrome used, occupation.\cite{10,11} In Cameroon, available data concerning metabolic syndrome among health workers.\cite{12} exist, but among other workers scarce data are known. This study aim to assess the prevalence of metabolic syndrome and its components among civil servants women working in Yaounde.

**MATERIALS AND METHODS**

**Study design:** This cross sectional study was conducted during the month of March 2016 because of the activities related to the international women day. Women were invited through media, announcement after mass, in departments, in many cultural groups for special chronic diseases free health campaign among women.

Each eligible volunteer civil servants women were referred 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, women who were not civil servants. All participants in the study provided 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). Ethics:

**Subjects**

This cross-sectional study was performed for one month, the study team worked in all week days except Sundays. 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 $\geq 30$.\(^{[13]}\)

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.\(^{[1,15]}\) High Density Lipoprotein cholesterol was determined using a heparin manganese precipitation of Apo B-containing lipoproteins.\(^{[16]}\) 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.\(^{[7]}\)

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

Demographic and clinical characteristics of the studied population are shown in Table 1. Civil servants women were between the ages of 25 and 60 years. The mean age of civil servants women was 35.19 ±09.60 years and the mean of BMI 31.26 ± 4.90 kg/m². Women with metabolic syndrome exhibit exhibit significant higher mean of age, body mass index, waist circumference, systolic blood pressure, diastolic blood pressure, fasting blood glucose, triglycerides, total cholesterol and lower HDL cholesterol comparatively to civil servants women without metabolic syndrome. The prevalence of metabolic syndrome and its components are reported in table 2. Metabolic syndrome was reported among 3.03% of civil servants women. The prevalence of individuals components of metabolic syndrome were shown to be: (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%) and were respectively in studied civil servants women. It has been found that among the five individual metabolic syndrome components three were most frequent in comparison to other metabolic components; Low HDL (73.95%), Abdominal obesity(60.47%), High blood pressure (47.44%). Table 3 shows the presence of zero and one or more components of metabolic syndrome. 4.19% of women presented no metabolic abnormality, we have noticed that 21.40 of women had one metabolic abnormality, 35.35% of women had two metabolic abnormalities and 31.16%, of women had three metabolic abnormalities, 7.440% had four and 0.47% had five criteria for metabolic syndrome.

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

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Total</th>
<th>Civil servants women with MetS</th>
<th>Civil servants women without MetS</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>All women, No. (%)</td>
<td>215</td>
<td>84</td>
<td>131</td>
<td>-</td>
</tr>
<tr>
<td>Age (years)</td>
<td>35.19 ±09.60</td>
<td>39.10 ± 08.78</td>
<td>31.65 ± 09.02</td>
<td>0.002*</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>31.26 ± 4.90</td>
<td>32.33 ± 7.13</td>
<td>29.18 ± 5.46</td>
<td>0.000*</td>
</tr>
<tr>
<td>WC, cm</td>
<td>94.73 ± 13.71</td>
<td>98.35 ± 14.47</td>
<td>91.45 ± 11.99</td>
<td>0.000*</td>
</tr>
<tr>
<td>SBP, mmHg</td>
<td>127.03 ± 19.74</td>
<td>131.69 ± 22.55</td>
<td>119.68 ± 16.12</td>
<td>0.000*</td>
</tr>
<tr>
<td>DBP, mmHg</td>
<td>86.14 ± 17.46</td>
<td>90.66 ± 18.71</td>
<td>79.39 ± 15.12</td>
<td>0.000*</td>
</tr>
<tr>
<td>FBS, mg/dl</td>
<td>97.77 ± 37.12</td>
<td>119.41 ± 19.66</td>
<td>83.89 ± 25.04</td>
<td>0.005*</td>
</tr>
</tbody>
</table>
**Table 2. Prevalence of Metabolic Syndrome and its individual components among civil servants women**

<table>
<thead>
<tr>
<th>Metabolic Syndrome</th>
<th>Civil Servants Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolic Syndrome</td>
<td>84 (39.07%)</td>
</tr>
<tr>
<td>Hyperglycemia</td>
<td>40 (18.6%)</td>
</tr>
<tr>
<td>Low HDL</td>
<td>159 (73.95%)</td>
</tr>
<tr>
<td>High Triglycerides</td>
<td>37 (17.21%)</td>
</tr>
<tr>
<td>Abdominal Obesity</td>
<td>130 (60.47%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>102 (47.44%)</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</td>
<td>9 (4.19%)</td>
</tr>
<tr>
<td>1 criteria</td>
<td>46 (21.40%)</td>
</tr>
<tr>
<td>2 criteria</td>
<td>76 (35.35%)</td>
</tr>
<tr>
<td>3 criteria</td>
<td>67 (31.16%)</td>
</tr>
<tr>
<td>4 criteria</td>
<td>16 (7.44%)</td>
</tr>
<tr>
<td>5 criteria</td>
<td>1 (0.47%)</td>
</tr>
</tbody>
</table>

**DISCUSSION**

Projection shows that death related to cardiovascular diseases by the year of 2030 is expected to rise to 23 million[^17] and this is not acceptable. Metabolic Syndrome is an worldwide exponential growth public health issue and it diagnostic is important. The worldwide prevalence of metabolic syndrome in adult population varies from 7 to 46.5%.[^18,19] They are already several metabolic syndrome studies in Cameroon.[^20,21,22] and it’s prevalence in previous studies as ranged between 0.2%.[^23] and 60.4%.[^24] and the highest is noted among type 2 diabetes.
The prevalence of MetS is depended of occupation.[25], the first step of reduction cardiovascular diseases risk among workers is the introduction of early diagnostic of individual risk factor or clustering of factors among individuals. Only one study has already focus on metabolic syndrome among health worker, therefore, this is the first study related to evaluate metabolic syndrome prevalence among civil servants women in Yaounde. According to the NCEP-ATPIII definition, the results of this study indicate a prevalence of 39.07% for metabolic syndrome among civil servants women of Yaounde. This prevalence is was considerably higher than previous reports on Sokoto civil servants women in Nigeria[26], also to other Cameroonian studies[21,22] and lower to bamileke women study.[20]

The comparison of our findings with another studies are limited because of the few available data of metabolic syndrome prevalence from civil servants populations in Africa as. It suggested that that the high metabolic syndrome prevalence among employees may be a result of the higher prevalence of physical inactivity among women as already reported in previous study.[27]

Many factors can justified the high prevalence of metabolic syndrome among those women, environmental factors, such as working hours, inadequate pay that act as stressing factors sociocultural factors, food overconsumption, physiological changes[28], inappropriate lifestyle behaviors such as nibbling contributes to Obesity that trigger hyper-tension, high serum cholesterol, low high-density lipoprotein and hyperglycemia.

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 civil servants women.

CONCLUSION

Metabolic syndrome prevalence is high among civil servants women of Yaounde. Low HDL Cholesterol, abdominal obesity and high blood pressure are the most frequent individual components. Government should take measures for diagnosis, prevention, control and management of chronic diseases at workplace.
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Declaration of Conflicting Interest
The authors declare that there are no conflicts of interest.

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REFERENCES


