Prevalence of Metabolic Syndrome among Catholic Sisters Mvolyé-Yaoundé Cameroon

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ABSTRACT

Background: Metabolic syndrome is considered as one of the most important worldwide public health challenge nowadays.

Objective: The aim of this study is to evaluate metabolic syndrome prevalence among a specific group of women (catholic sisters Mvolyé-Yaoundé Cameroon).

Methods: In this study, 56 catholic sisters were investigated and metabolic syndrome was diagnosed using Adult Treatment Panel-III (ATP-III) definition.

Results: The overall prevalence of metabolic syndrome among sisters was 14.58%. The mean of age, waist circumference, body mass index, systolic and diastolic blood pressure were significantly (p<0.05) higher among sisters with metabolic syndrome. Low HDL (91.67%) and High blood pressure level (60.49%) were respectively the most frequent metabolic syndrome components. 12.50%, 2.08% and 0% had three, four and five criteria for metabolic syndrome, respectively.

Conclusion: Metabolic syndrome is common in this group of catholic sisters.

Key words: Metabolic syndrome, Catholic sisters, Yaoundé-Cameroon.

INTRODUCTION

Metabolic syndrome is a cluster of several risk factors including dysglycemia, high blood pressure, elevated triglyceride levels, low high-density lipoprotein cholesterol levels (HDL-C), and obesity that predisposes individuals to a high risk of cardiovascular disease and type 2 diabetes. [1] Several definitions have been proposed and the working definition was release by National Cholesterol Education Program. [2] It is estimated that 20 to 25% of the world population has Metabolic Syndrome. [3] Therefore metabolic syndrome is an important health problem. [4-6] Many studies reported an increasing prevalence of metabolic in developing countries; in Cameroon few studies have already been done. [7-12] The prevalence of metabolic syndrome depends on age, region, urban or rural environment, ethnicity, and the definition of metabolic syndrome used. [13] Catholics sisters may possess a high rate of cardiometabolic risk, the present study aimed to evaluate metabolic syndrome among this specific group of women.

MATERIALS AND METHODS

Ethics

Admission to the study was based solely on voluntary participation. The study population consisted of catholic sisters living in Mvolyé Cameroon near the minor basilica of Yaounde. The volunteer’s sisters were referred at the Catholic Holy Spirit center, Yaounde Cameroon. All participants in the study provided verbal informed consent. The study was approved by the...
Education Planning Commission of the Center. All measurements and questionnaire were in accordance with the Helsinki Declaration (1983 version).

Data collection

The data collection comprised healthcare questionnaire, anthropometric measurement of weight, Height, and abdominal circumference, health examination and laboratory test in fasting state for lipids.

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 $\geq 30$.\textsuperscript{14}

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 Jocca\textsuperscript{™} 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.\textsuperscript{15,16} High Density Lipoprotein cholesterol was determined using a heparin manganese precipitation of Apo B-containing lipoproteins.\textsuperscript{17} Fasting capillary blood glucose was determined using glucose test strips (GlucoPlus\textsuperscript{TM}).

Definition of Metabolic Syndrome

Sisters were considered to have Metabolic Syndrome if they had three or more of the following criteria, according to the ATPIII criteria.\textsuperscript{2}

1. Abdominal obesity, defined as a waist circumference $\geq$ 88 cm (35 inch)
2. Hypertriglyceridemia $\geq$ 150 mg/dL (1.7mmol/L) or drug treatment for elevated triglycerides
   • HDL cholesterol level $<$50 mg/dL (1.3 mmol/L) in women or drug treatment for low HDL-C
   • Blood pressure $\geq$ 130/85 mmHg or drug treatment for elevated blood pressure
   • 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\textsuperscript{®} 8.2. Continuous variables are reported as means $\pm$ 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. The mean age of catholic sisters was 37.04$\pm$9.27 years and the mean of BMI 26.38$\pm$4.17kg/m$^2$. Sisters with metabolic syndrome exhibit significant higher mean of age, waist circumference, body mass index, systolic and diastolic blood pressure. The prevalence of metabolic syndrome and its components are reported in Table 2. The frequency of metabolic syndrome was present among 14.58% of sisters. The prevalence of the commonest individuals components of metabolic syndrome were shown to be: low high density lipoprotein-cholesterol levels 91.67%, high blood pressure 37.50 and high waist circumference 27.08% in studied population. Table 3 shows the presence of zero and one or more components of the metabolic syndrome. We have noticed that
47.92 of women had one metabolic abnormality, 37.50% of women had two metabolic abnormalities and 12.50% of women had three metabolic abnormalities. 2.08% had four but neither nobody had zero or five metabolic abnormalities. Table 4 presents metabolic syndrome prevalence according age trends. The prevalence of metabolic syndrome was increasing among catholic sisters.

### DISCUSSION

In worldwide countries, adoption non synchronous modern way of life has brought increased of chronic diseases. Many communities may be in that situation and the only way to know is to evaluate their cardiovascular risk. Metabolic syndrome refers as the cluster of several chronic diseases central obesity, hypertension, hypertriglyceridemia, low plasma high-density lipoprotein (HDL) cholesterol levels and hyperglycemia. It diagnostic is therefore useful medical tool for prediction of further arrival of type 2 diabetes and cardiovascular diseases. The control of those risk factors will limit mortality related to cardiovascular diseases. Studies have shown worldwide prevalence of metabolic syndrome in women around the world ranged from 7% to 56%. [18] These data show that metabolic syndrome is common among different communities. Our study aimed to determined metabolic syndrome prevalence among catholic’s sisters leaving in Mvolyé Yaoundé Cameroon. Generally admission in religious community is done after preliminary medical check-up of infectious diseases, but this check-up never concerns metabolic syndrome. The general prevalence of metabolic syndrome was 14.58% among catholic sisters. This prevalence is higher than the one of Mbo women, [12] but lower than the one reported in Bamileke women, [9] and postmenopausal women. [19] This prevalence could be attributed to socioeconomic, environmental changes, genetic and lifestyle. Sisters communities members are originate from different countries, including Cameroon, Nigeria, Canada, France, Senegal, and Congo are force to live together in cultural exchanges. In their eating habits, each sister

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**Table 1: Baseline of data of sisters with and without Metabolic Syndrome.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Total</th>
<th>Sisters with MetS</th>
<th>Sisters without MetS</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>37.0±9.27</td>
<td>43.5±7.67</td>
<td>35.9±9.13</td>
<td>0.042*</td>
</tr>
<tr>
<td>WC, cm</td>
<td>79.8±15.52</td>
<td>91.4±4.35</td>
<td>76.8±14.73</td>
<td>0.000*</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>26.3±4.17</td>
<td>31.6±3.08</td>
<td>25.4±3.64</td>
<td>0.000*</td>
</tr>
<tr>
<td>SBP, mmHg</td>
<td>120.3±26.43</td>
<td>147±16.12</td>
<td>115.4±24.55</td>
<td>0.001*</td>
</tr>
<tr>
<td>DBP, mmHg</td>
<td>76.3±16.43</td>
<td>91.7±12.10</td>
<td>73.7±15.71</td>
<td>0.006*</td>
</tr>
<tr>
<td>FBS, mg/dl</td>
<td>70.47±10.39</td>
<td>72.71±4.04</td>
<td>70.09±10.42</td>
<td>0.543</td>
</tr>
<tr>
<td>TG, mg/dl</td>
<td>116.20±56.78</td>
<td>129.28±33.61</td>
<td>113.97±59.87</td>
<td>0.515</td>
</tr>
<tr>
<td>HDL-Chol, mg/dl</td>
<td>39.35±14.79</td>
<td>40.42±5.50</td>
<td>39.17±15.88</td>
<td>0.837</td>
</tr>
<tr>
<td>T-Chol, mg/dl</td>
<td>120.79±61.86</td>
<td>105.2±52.90</td>
<td>123.4±63.46</td>
<td>0.479</td>
</tr>
</tbody>
</table>

*Significant difference between sisters with MetS and sisters without MetS.

BMI: Body mass index, WC: waist circumference, SBP: systolic blood pressure, DBP: diastolic blood pressure, FBS: fasting blood glucose, TG: triglyceride, T-CHOL: total cholesterol and HDL-CHOL: HDL-cholesterol. *P value less than 0.05 was considered significant.

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

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolic Syndrome</td>
<td>7</td>
<td>14.58%</td>
</tr>
<tr>
<td>Fasting Blood Sugar &gt;110 mg/dl</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>High Density Lipoprotein-cholesterol &lt; 40 mg/dl</td>
<td>44</td>
<td>91.67%</td>
</tr>
<tr>
<td>Triglycerides &gt; 150 mg/dl</td>
<td>6</td>
<td>12.30%</td>
</tr>
<tr>
<td>Waist Circumference &gt; 102 cm</td>
<td>13</td>
<td>27.08%</td>
</tr>
<tr>
<td>Systolic blood pressure &gt;130mmHg/ Diastolic blood pressure&gt;85 mmHg</td>
<td>18</td>
<td>37.50%</td>
</tr>
</tbody>
</table>

**Table 3: Metabolic Syndrome Items among Catholic Sisters.**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 criteria n (%)</td>
<td>0</td>
<td>0.00%</td>
</tr>
<tr>
<td>1 criteria n (%)</td>
<td>23</td>
<td>47.92%</td>
</tr>
<tr>
<td>2 criteria n (%)</td>
<td>18</td>
<td>37.50%</td>
</tr>
<tr>
<td>3 criteria n (%)</td>
<td>6</td>
<td>12.50%</td>
</tr>
<tr>
<td>4 criteria n (%)</td>
<td>1</td>
<td>2.08%</td>
</tr>
<tr>
<td>5 criteria n (%)</td>
<td>0</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

**Table 4: Distribution of Sisters with and without Metabolic Syndrome by age groups.**

<table>
<thead>
<tr>
<th>Age groups in years</th>
<th>Age trend</th>
<th>SMet-</th>
<th>SMet+</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-29% (%)</td>
<td>18-29</td>
<td>9 (100.00%)</td>
<td>0 (0.00%)</td>
</tr>
<tr>
<td>30-39% (%)</td>
<td>30-39</td>
<td>17 (89.47%)</td>
<td>2 (10.52%)</td>
</tr>
<tr>
<td>40-49% (%)</td>
<td>40-49</td>
<td>12 (80.00%)</td>
<td>3 (20.00%)</td>
</tr>
<tr>
<td>50-60% (%)</td>
<td>50-60</td>
<td>3 (75.00%)</td>
<td>2 (25.00%)</td>
</tr>
</tbody>
</table>
have her cooking day and the meal that is provide belong to the tradition of the cooker, for them it a sign a good integration and equality. To deepen their experience of God, they spend most of their time in prayers and this requires to them to remain in an inactive position for long periods of time; so they live indoors and that represent a physically passive behavior. In addition to the reduction in physical activity, unhealthy eating habit is noted through high rate of nibbling of sweets. These sedentary behavior and physical inactivity as reported in previous studies [20] have modified the anthropometric profile of the group of sisters with cardiovascular risk. Sisters with metabolic syndrome exhibit significant higher mean of age, body mass index, waist circumference and blood pressure.

The most common metabolic risk was low HDL cholesterol and hypertension. An important number of individuals have low HDL cholesterol even among healthy adults and this is considered as a recurring phenotype among metabolic syndrome patient. [21-23] Nobody had hyperglycaemia, studies shows that among the fifth metabolic syndrome component, hyperglycaemia is the last course for metabolic syndrome development. It was also note that frequency of metabolic syndrome increases with age among sisters and this finding is consistent with many previous studies. [24-26]

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

CONCLUSION

This study has demonstrated that metabolic syndrome in catholic sisters was frequent. Low HDL-cholesterol and high blood pressure were the most common abnormalities among catholic sisters.

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Declaration of Conflicting Interest: The authors declare that there is no conflict of interest. All authors read and approved the final manuscript.

REFERENCES


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