International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

Prevalence of Metabolic Syndrome among Catholic Sisters Mvolyé-Yaoundé Cameroon

Damaris Enyegue Mandob, Andjama Lydie

Department of Biological Sciences, Higher Teachers' Training College, University of Yaoundé I, P.O. Box 047, Yaoundé, Cameroon.

Corresponding Author: Damaris Enyegue Mandob

Received: 05/03/2016 *Revised: 06/03/2016* *Accepted: 29/04/2016*

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≥30. [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™ 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. [15,16] High Density Lipoprotein cholesterol was determined using a heparin manganese precipitation of Apo B-containing lipoproteins. [17] Fasting capillary blood glucose was determined using glucose test strips (GlucoPlusTM).

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. [2]

1. Abdominal obesity, defined as a waist circumference in women ≥ 88 cm (35 inch)
2. Hypertriglyceridemia ≥ 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 ≥ 130/85 mmHg or drug treatment for elevated blood pressure
- Fasting plasma glucose (FPG) ≥ 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. The mean age of catholic sisters was 37.04±9.27 years and the mean of BMI 26.38±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.

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

Parameters	Total	Sisters with MetS	Sisters without MetS	P-value
Age (years)	37.04±9.27	43.57±7.67	35.92±9.13	0.042*
WC, cm	79.87±15.52	91.42±4.35	76.87±14.73	0.000*
BMI, kg/m²	26.38±4.17	31.69±3.08	25.47±3.64	0.000*
SBP, mmHg	120.35±26.43	147±16.12	115.46±24.55	0.001*
DBP, mmHg	76.33±16.43	91.71±12.10	73.70±15.71	0.006*
FBS, mg/dl	70.47±10.39	72.71±4.04	70.09±10,42	0.543
TG, mg/dl	116.20±56.78	129.28±33.61	113.97±59.87	0.515
HDL-Chol, mg/dl	39.35±14.79	40.42±5.53	39.17±15.88	0.837
T-Chol, mg/dl	120.79±61.86	105.28±52.90	123.43±63.46	0.479

*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.

	Number	Percentage
Metabolic Syndrome	7	14.58%
Fasting Blood Sugar >110 mg/dl	0	0.00%
High Density Lipoprotein-cholesterol < 40 mg/dl	44	91.67%
Triglycerides > 150 mg/dl	6	12.50%
Waist Circumference > 102 cm	13	27.08%
Systolic blood pressure >130mmHg/ Diastolic blood pressure>85 mmHg	18	37.50%

Table 3: Metabolic Syndrome Items among Catholic Sisters.

Parameters	Number	Percentage
0 criteria n (%)	0	0.00%
1 criteria n (%)	23	47.92%
2 criteria n (%)	18	37.50%
3 criteria n (%)	6	12.50%
4 criteria n (%)	1	2.08%
5 criteria n (%)	0	0.00%

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

Age groups in years	Age trend	SMet-	SMet+
18-29n (%)	18-29	9(100.00%)	0(0.00%)
30-39n (%)	30-39	17(89.47%)	2(10.52%)
40-49 n (%)	40-49	12(80.00%)	3(20.00%)
50-60 (%)	50-60	3(75.00%)	2(25.00%)

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 Yaounde 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

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.

ACKNOWLEDGEMENTS

The authors thank all sisters of Holy Spirit community of Yaounde, as well as the staff of the health center.

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

REFERENCES

1. Miranda PJ, DeFronzo RA, Califf RM, et al. "Metabolic syndrome: definition, pathophysiology, and mechanisms. Am Heart J. 2005; 149 (1): 33-45.
2. Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults Executive summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). JAMA.2001; 285:2486-97.
3. Borges PKO, Gimeno SGA, Tomita NE, et al. Prevalence and characteristics associated with metabolic syndrome in Japanese-Brazilians with and without periodontal disease. Cad Saude Publ. 2007; 23(3), 657-668.
4. Ballantyne CM, Olsson AG, Cook TJ, et al. Influence of low high-density lipoprotein cholesterol and elevated triglyceride on coronary heart disease events and response to simvastatin therapy in 4S. Circulation. 2001; 104: 3046-3051.
5. Downs JR, Clearfield MS, Weis E, et al. Primary prevention of acute coronary events with lovastatin in men and women with average cholesterol levels: Results of AFCAPS/TexCAPS. Airforce/Texas coronary atherosclerosis prevention study. J. Am. Med. Assoc.1998; 279: 1615-1622.
6. Shepherd J, Cobbe SM, Ford I, et al. Prevention of coronary heart disease with pravastatin in men with hypercholesterolemia. N. Engl. J. Med. 1995; 333: 1301-1308.
7. Fezeu L, Balkau B, Kengne, AP, et al. Metabolic syndrome in a sub-Saharan African setting: Central obesity may be the key determinant. Atherosclerosis. 2006; 193: 70-76.
8. Mandob ED, Ngondi JL, Fomekong DIG, et al. Prediction and prevalence of metabolic syndrome in overweight and obese subjects in Cameroon. Int J Biomed Pharma Sci. 2008; 2:117-121.
9. Mandob DE, Fomekong GID, Ngondi JL. Prevalence of Metabolic Syndrome Among Bamileke Ethnic Women Yaounde, Cameroon. Int J Pharm Bio Sci. 2013; 4: 255 -262.
10. Dimodi HT, Etame SL, Nguimkeng B, et al. Prevalence of Metabolic Syndrome in HIV-

Infected Cameroonian Patients. WJA. 2014; 4: 85-92.
11. Mandob Enyegue Damaris, Réné Samuel Minka, Jean Marcel Solle Sah. Prevalence of Metabolic Syndrome among Normal Weight Cameroonians. WJPPS, 2015; 4(9): 1569-1578.
12. Mandob DE, Samuel M, Viviane ON. Prevalence of Metabolic Syndrome among Mbo Women Yaounde-Cameroon. J Metabolic Synd, 2015;4:186.doi: 10.4172/ 2167-0943.1000186.
13. Kaur J. A Comprehensive Review on Metabolic Syndrome. Cardiol Res Pract, 2014; 943162.
14. World Health Organization (1997b) Obesity Preventing and Managing the global obesity. Obesity: Preventing and managing the Global Epidemic Report of a WHO. Consultation on Obesity, 3-5 June 1997, Geneva, WHO/NUT / NCD/ 98.1.
15. Allain CC, Poon LS, Chan CSG, et al. Quantitative determination of serum cholesterol by the use of enzymes. Clin Chem. 1974; 20:470-475.
16. Buccolo G, David H, Quantitative determination of serum triglycerides by the use of enzymes. Clin Chem. 1973; 19(5): 476-482.
17. Warnick GR, Alberers JJ. Heparin-Mn+2 quantification of high density - lipoprotein by ultrafiltration procedure for lipemic samples. Clin Chem. 1978; 24: 900-904.
18. Cameron AJ, Shaw JE, Zimmet PZ. "The metabolic syndrome: prevalence in worldwide populations," Endocrinology and Metabolism Clinics of North America. 2004; 33 (2): 351-375.
19. Mandob DE, Rosalie NK, Marlyse LK. Prevalence of metabolic syndrome among postmenopausal women Yaounde-Cameroon. Int J Health Sci Res. 2015; 5(11):278-284.
20. Ford ES, Kohl III HW, Mokdad AH, et al. "Sedentary behavior, physical activity, and the metabolic syndrome among U.S. adults," Obesity Research, 2005; 13(3) 608-614.
21. Heiss G, Johnson NJ, Reiland CE, et al. The epidemiology of plasma high-density lipoprotein cholesterol levels. The lipid research clinics program prevalence study. Circulation, 1980; 62: 116-136.
22. MacLean DR, Petrasovits A, Connelly PW, et al. Little, Plasma lipids and lipoprotein reference values and the prevalence of dyslipoproteinemia in Canadian adults. Canadian Heart Health Surveys Research Group. Can J Cardiol. 1999;15: 434-444.
23. Onat AG, Surdum-Avci, Senocak M, et al. Plasma lipids and their interrelationship in Turkish adults. J. Epidemiol. Community Health. 1992; 5: 470-476.
24. Guarner V, Carbó R, Rubio ME, et al. Aging of the cardiovascular system. In:Benhagen EF, editor. Hypertension: New Research. USA: Nova Biomedical Books Publishers. 2005. 47-68.
25. Baños G, El Hafidi M, Pérez-Torres I, et al. Insulin resistance and the metabolic syndrome. In:Yao EB, editor. Insulin Resistance: New Research. USA: Nova Biomedical Books Publishers.2009; 49-97.
26. Guarner V, Rubio-Ruiz ME, Perez-Torres I, et al. Relation of aging and sex hormones to metabolic syndrome and cardiovascular disease. Exp Gerontol. 2011; 46:517-523.

How to cite this article: Mandob DE, Lydie A. Prevalence of metabolic syndrome among catholic sisters Mvolyé-Yaoundé Cameroon. Int J Health Sci Res. 2016; 6(5):293-297.

****