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RESEARCH ARTICLE

PREVALENCE OF METABOLIC SYNDROME AMONG WORKERS FROM CAMPUS POLICE OF YAOUNDE I UNIVERSITY-CAMEROON

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ABSTRACT

Objective: Metabolic syndrome is still unknown among Cameroonian population and few studies have been done among workers in Africa. This study aimed to estimate metabolic syndrome prevalence among Campus Police workers of Yaounde I University, Cameroon.
Methods: A total of 53 workers (6 women and 47men) participated in the study, they were aged between 20-55 years. For their studied data, they were referred to the Andre Fouda Medical Fundation in Yaounde. Metabolic syndrome was diagnosed using Adult Treatment Panel-III (ATP-III) 2001 guidelines.
Results: The prevalence of metabolic syndrome among workers was (5.66%). Low HDL Cholesterol (54.72%), High blood pressure level (41.51%) and abdominal obesity (20.75%) were respectively the commonest metabolic syndrome features. 5.66%, 0% and 0% had three, four and five criteria for metabolic syndrome, respectively. A high proportion of the workers (79.25%) has at least one metabolic syndrome abnormality.
Conclusion: Although metabolic syndrome prevalence is still low among Campus police workers of Yaounde I University, a high proportion of them are already at greater metabolic syndrome risk. Annual Medical check-up and educational programs for cardiovascular diseases in these workers should be an efficient measure for good cardiovascular health.

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INTRODUCTION

Metabolic syndrome is a cluster of risk factors that raises the risk of cardiovascular disease and type 2 diabetes. These factors are hyperglycemia, high blood pressure, dyslipidemia and central obesity (Grundy, 2005, Wilson *et al*., 2005). The incidence and persistence of chronic disease in the world is the actual public challenge of the century. Several definitions of metabolic syndrome have been proposed, but only two are widely used in different studies (NCEPATP III) Executive summary ATP III, 2001, Alberti *et al*., 2006). Projections show that in sub-Saharan Africa, Non Communicable Diseases are projected to surpass infectious diseases by 2030 (Mathers *et al*., 2006). With the facilities schedule by scientific progress on 20th century chronic diseases epidemiology is risen in both developed and developing countries. Cameroon is also facing the growing epidemic of metabolic syndrome as reported in different studies(Balti *et al*., 2013, Fezeu *et al*., 2007, Mandob *et al*., 2008, Mandob *et al*., 2008, Mandob *et al*., 2013, Mandob *et al*., 2016a, Mandob *et al*., 2015, Mandob *et al*., 2016b, Mandob *et al*., 2016c). The importance to diagnose metabolic syndrome is to identify subject at risk and to enable preventive measures. The prevalence of metabolic syndrome depends environment, ethnicity, and the definition of metabolic syndrome used (Kolovou *et al*., 2007) and also on occupational status (Sánchez-Chaparro *et al*., 2008, Nair, 2010). Campus police workers spent most of their working day on a sedentary position with disruption in diet, this put them to be at high risk. Little Cameroon employee studies was undertook, this study estimate metabolic syndrome prevalence among employee of campus police workers of Yaounde I University.

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MATERIALS AND METHODS

Ethics

The study was conducted for the higher teacher training college of Yaounde I University opening day during the month of December 2015.Admission to the study was based solely on voluntary participation of Campus police workers. The study volunteers were therefore referred at the Medical Foundation Andre Marie Fouda, Yaounde Cameroon. Females were

excluded from the study if they were pregnant or lactating. All participants in the study provided verbal informed consent. The study was approved by the Education Planning Commission of Medical Foundation and the Rector of Yaounde I University gave his authorization. All measurements and questionnaire were in accordance with the Helsinki Declaration (1983 version).

Subjects

This cross-sectional study was performed for one month, the study team worked in all week days except Sundays. The study population consisted of Campus police workers of Yaounde I University only. The data collection comprised healthcare questionnaire, anthropometric measurement of weight, Height, and abdominal circumference, health examination and laboratory test in fasting state for lipids and fasting blood glyceamia. 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. (WHO, 1997). A well trained nurse drew 10 ml of fasting morning blood samples from the examinee's arm. Two ml was dispensed into fluoride oxalate tubes and the rest into vacutainer plain for separation of plasma and serum respectively. 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. Glucose was assay in the plasma by the glucose oxydase peroxidase colorimetric enzymatic method while serum was used for lipid profile. Total cholesterol and triglycerides in plasma were measured using previously described standard methods (Allain *et al*., 1974, Buccolo and David, 1974). High Density Lipoprotein cholesterol was determined using a heparin manganese precipitation of Apo B-containing lipoproteins (Warnick *et al*., 1978).

Definition of Metabolic Syndrome

Workers were considered to have Metabolic Syndrome if they had three or more of the five following criteria, according to the ATPIII definition (NCEPATP III) Executive summary ATP III, 2001)

1. Abdominal obesity, defined as a waist circumference in women ≥ 88 cm (35 inches), in men ≥ 102 cm (40 inches)
2. Hypertriglycerideamia ≥ 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, <40 mg/dL (1mmol/L) in men 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) ≥ 110 mg/dL (6.1mmol/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 or numbers. 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

Mean age was 37.67±6.77years. A total of 102 workers were sensitized but only 53 participated. With the little number of women in the study, the demographic data of Campus police workers were analyzed without gender difference in Table 1. Table 2 shows the presence of zero and one or more components of the metabolic syndrome. 20.75% of workers presented no metabolic abnormality. The employee with one metabolic abnormality represented 39.62% of the screened population. 33.96% of the group had two metabolic abnormalities and 5.66% had three metabolic abnormalities. Nobody had four or neither five metabolic abnormalities. The prevalence of metabolic syndrome and its different components are reported in table 3. Finally 5.66% of the population fulfilled metabolic syndrome criteria. The prevalence of individuals components of metabolic syndrome were shown to be: high fasting glucose levels 3.77%, low high density lipoprotein-cholesterol levels 54.72%, high triglyceride levels 3.77%%, high waist circumference 6.81 % and high blood pressure 41.51%). in studied population. It has been found that among the five individual metabolic syndrome components only two were most frequent in comparison to other metabolic components; Low HDL Cholesterol (54.72%) and high blood pressure (41.51%). Table 4 presents metabolic syndrome prevalence according population characteristic. The prevalence of metabolic syndrome is higher in the age-trends 35-55years comparatively to the age trend of < 35years. Metabolic syndrome was only prevalent among males, non smokers and married workers.

Table 1. Characteristics of the study subjects

Parameters	n(%)
Women(n)	6(11.32%)
Men(n)	47(88.67)
	Mean ±SD
Age (years)	37.67± 6.77
BMI, kg/m²	26.38±4.17
WC, cm	91.22±12.38
SBP, mmHg	119.18±15.65
DBP, mmHg	81.01±13.57
FBS, mg/dl	84.22±13.92
TG, mg/dl	88.39±29.23
T-Chol, mg/dl	166.86± 26.09
HDL-Chol, mg/dl	40.07±25.69

BMI: Body mass index, WC: waist circumference, WHR: waist to hip ratio, SBP: systolic blood pressure, DBP: diastolic blood pressure, FBS: fasting blood glucose, TG: triglyceride, T-CHOL: total cholesterol and HDL-CHOL: HDL-cholesterol, SD**:** standard deviation.

Table 2. Metabolic Syndrome Items

Parameters	Percentage
0 criteria n (%)	20.75%
1 criteria n (%)	39.62%
2 criteria n (%)	39.96%
3 criteria n (%)	5.66%
4 criteria n (%)	0.00%
5 criteria n (%)	0.00%

Table 3. Prevalence of Metabolic Syndrome and its individual components

	Workers
Metabolic Syndrome	5.66%
Hyperglyceamia	3.77%
Low HDL Cholesterol	54.72%
High Triglycerides	3.77%
Abdominal Obesity	20.7 %
Hypertension	41.51%

Table 4. Distribution of Metabolic Syndrome according to their characteristics

	Total	Metabolic Syndrome	No Metabolic Syndrome
Age groups in years			
< 35years	19	1	18
35-55 years	34	2	33
Gender			
Males	47	3	44
Females	6	0	6
Smoking status			
Smokers	4	0	4
Non Smokers	49	3	46
Marital status			
Married	34	3	31
Unmarried	19	0	19

DISCUSSION

Metabolic syndrome is considered as a useful clinical tool to predict premature cardiovascular events and its prevalence depends on working status. To solve their daily problems, human beings are obliged to work, so a high proportion of populations are workers. However this working situation makes them to spent most time at workplaces sitting in a fixed position for long hours, these irregular working hours, lead to inadequate opportunities for recovery and unwinding that favors chronic diseases conditions. Early management of individual risk factor or clustering of factors is necessary to reduce the risk of cardiovascular diseases and minimized consequences in different population. This is the first Cameroonian study dealing with metabolic syndrome prevalence among watchman occupational status. A prevalence of 5.66%(0% for women and 5.66% for men) was recorded among campus police workers of of Yaounde I University. With the scanty data of metabolic syndrome among this specific group of workers, this make this study not easily comparable. However this prevalence is higher with the prevalence of 0.7% noted among nurses (Tachang *et al*., 2012) but lower with others Cameroonians study (Mandob *et al*., 2013, Mandob *et al*., 2016a). The number of metabolic syndrome components was limited only to three, the absence of four or five components have lower our study prevalence, it is well known that higher probability of having metabolic syndrome depending on the number of components present (Lorenzo *et al*., 2003, Malik al., 2004). Metabolic syndrome was more prevalent among older age trend (35-55 years) comparetively to the youngest age group (< 35years). This finding is consistent with other reports infact aging is normally associated to depletion of muscle mass and elevation of body fat that favour central obesity and hence metabolic syndrome (Carr *et al*., 2004). We found that employees with metabolic syndrome were exclusively male compared to those without it. This result can be attributed to the low female participation and the fact that gender prevalence rates of metabolic syndrome vary widely across different populations (Zuo *et al*., 2009, Ford *et al*., 2004). Metabolic syndrome was not dependent of smoking, data among this association is inconsistent and controversial. Marital status might affect metabolic syndrome differently with regard to sex and occupations. About 80% of the workers are at great risk of metabolic syndrome. More than half (54.72%) of the workers have low HDL, the reasons for excess risk low HDL in Campus police workers need to be studied. Some probable explanations are as follow; this can be genetic predisposition but also linked to lifestyle such as poor dietary habits. The prevalence of enlarge waist circumference was 20.7%. Campus police workers has 12h working, studies show that the length of work hours has been a significant factor for waist circumference among workers (Emdad *et al*., 1998, Nakamura *et al*., 1998). Strengths of our study are the use of standardized data collection of protocol as well as a relatively homogenous population of campus police. Although metabolic syndrome studies in Cameroon are arising, this study is the first study evaluating metabolic syndrome among campus police workers. This study has some major limitations, the small sample size of the workers, the low female participation Yaounde and it cross-sectional nature prevents it to be generalized in all Campus police workers.

Conclusion

Although the metabolic syndrome prevalence is low among Campus police workers, more than 30% of this population is already at greater metabolic syndrome risk. Low HDL Cholesterol and High blood pressure prevalence is high in this study, Educational programs for promoting healthy lifestyle and also annual medical check-up, should be institute among these workers.

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Declaration of Conflicting Interest

The authors declare that there are no conflicts of interest.

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REFERENCES

Alberti KG, Zimmet P, Shaw J. 2006. Metabolic syndrome a new worldwide definition. A Consensus Statement from the International Diabetes Federation. *Diabet Med.,* 23: 469-80.

Allain CC, Poon LS, Chan CSG, Richmond W, Fu PC. 1974. Quantitative determination of serum cholesterol by the use of enzymes. *Clin Chem.,* 20:470-475.

Balti EV, Kengne AP, Fokouo JVF, Nouthé BE, Sobngwi. 2013. Metabolic Syndrome and Fatal Outcomes in the Post-Stroke Event: A 5-Year Cohort Study in Cameroon, *PLoS ONE,* E; 8: e60117. doi:10.1371/journal. pone.0060117.

Buccolo G. and David H. 1974. Quantitative determination of serum triglycerides by the use of enzymes. *Clin Chem.,* 19: 476-482.

Carr DB, Utzschneider KM, Hull RL, Kodama K, Retzlaff BM, *et al*. 2004. "Intraabdominal Fat Is a Major Determinant of the National Cholesterol Education Program Adult Treatment Panel III criteria for the Metabolic Syndrome," *Diabetes*, 53.8.2087, 53: 2087-2094. doi:10.2337

Emdad R, Belkic K, Theorell T, Cizinsky S. 1998. What prevents professional drivers from following physicians' cardiologic advice? *Psychother Psychosom*, 67: 226-40.

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*, 2005; 285: 2486-97.

Fezeu L, Balkau B, Kengne AP, Sobngwi E, Mbanya JC. 2007. Metabolic syndrome in a sub-Saharan African setting: central obesity may be the key determinant. *Atherosclerosis*, 193:70-76

Ford ES, Giles WH, Mokdad AH. 2004. Increasing prevalence of the metabolic syndrome among U.S. adults. *Diabetes Care*, 2:2444-9.

Grundy SM, Cleeman JI, Daniels SR, Donato KA, Eckel RH, *et al*. 2005. "Diagnosis and management of the metabolic syndrome: an American Heart Association/National Heart, Lung, and Blood Institute scientific statement. *Circulation*, 112: 2735-2752.

Kolovou GD, Anagnostopoulou KK, Salpea KD, Mikhailidis DP. 2007. The prevalence of metabolic syndrome in various populations. *Am J Med Sci*., 333:362-71.

Lorenzo C, Okoloise M, Williams K, Stern MP, Haffner SM. 2003. The MetS as predictor of type 2 diabetes. *Diabetes Care*, 26: 3153-3159.

Malik S, Wong ND, Franklin SS, Kamath TV, L'Italien GJ, *et al*. 2004. Impact of the MetS on mortality from coronary heart disease, cardiovascular disease, and all causes in the United States adults. *Circulation,* 110: 1245-1250.

Mandob DE, Fomekong GID, Ngondi JL. 2013. Prevalence of Metabolic Syndrome Among Bamileke Ethnic Women Yaounde, Cameroon. *Int J Pharm Bio Sci*., 4: 255 -262.

Mandob DE, Samuel M, Viviane ON. 2015. Prevalence of Metabolic Syndrome among Mbo Women Yaounde-Cameroon. *J Metabolic Synd*., 4:186.doi: 10.4172/2167-0943.1000186

Mandob DE. and Andjama L. 2016. Prevalence of Metabolic Syndrome among Catholic Sisters Mvolyé-Yaounde Cameroon *IJHSR*, 20164-6394. doi: 10.20959

Mandob DE. and Mbassi EJ. 2016. Prevalence of Metabolic Syndrome Among Obese Women According to their Type of Fat Distribution Yaounde-Cameroon *WJPPS,* 6288. doi: 10.20959

Mandob DE. and Mounmo TD. 2016. Prevalence of Metabolic Syndrome among Toupouri Ethnic Men Cameroon (Yaounde) *IJCR,* 8: 28079-28082

Mandob DE. and Zoa PA. 2016. Prevalence of Metabolic Syndrome among Eton Men Cameroon (Yaounde) *WJPPS,* 20164-6394. doi: 10.20959

Mandob ED, Ngondi JL, Fomekong DIG, Agbor G, Oben JE. 2008. Prediction and prevalence of metabolic syndrome in overweight and obese subjects in Cameroon. *Int J Biomed Pharma. Sci.,* 2:117-121.

Mathers CD. and Loncar D. 2006. Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Med*., 3(11):e442.

Nair CV. 2010. Metabolic syndrome an occupational perspective," *Indian J Community Med.,* 35(1) 122-124. doi:10.4103/0970-0218.62569

Nakamura K, Shimai S, Kikuchi S, Takahashi H, Tanaka M, *et al*. 1998. Increases in body mass index and waist circumference as outcomes of working overtime. *Occup Med*., 48: 169-73.

Sánchez-Chaparro MA, Calvo-Bonacho E, Gonzá- lez-Quintela A, Fernández-Labandera C, Cabrera M, *et al*. 2008. "Ibermutuamur Cardiovascular Risk Assessment (ICARIA) Study Group. Occupation-Related Differences in the Prevalence of Metabolic Syndrome," *Diabetes Care*, 31, 1884-1885.

Tachang GK, Choukem SP, Ndjebet J, Dzudie A, Titanji VPK. 2012. Prevalence of hyperglycaemia, obesity and metabolic syndrome (a three component study) among hospital personnel in the Littoral Region of Cameroon. *IJMMS,* DOI: 10.5897/IJMMS12. 104 4(10), 232-237.

Warnick GR. and Alberers JJ. 1978. Heparin-Mn^{+2} quantification of high density-lipoprotein by ultrafiltration procedure for lipemic samples. *Clin Chem.,* 24: 900-904.

Wilson PWF, D'Agostino RB, Parise H, Sullivan L, Meigs JB. 2005. Metabolic syndrome as a precursor of cardiovascular disease and type 2 diabetes mellitus. *Circulation*, 112: 3066-3072.

World Health Organisation, 1997. Obesity Preventing and Managing the global obesity. Obesity: Preventing and managing the Global Epidemic Report of a WHO. Consultation on Obesity, 3-5 June, Geneva, WHO/NUT/ NCD/98.1(1997b).

Zuo H, Shi Z, Hu X, Wu M, Guo Z, *et al*. 2009. Prevalence of metabolic syndrome and factors associated with its components in Chinese adults. *Metabolism*, 58:1102-8.

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