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RESEARCH ARTICLE

Epidemiological aspects of metabolic syndrome in the obese population of Ouidah in southwestern Benin (West Africa)

YESSOUFOU Abdou Ganiou.[1], BEHANZIN Justin[1], ISSOTINA ZIBRILA Abdoulaye.[2], DJIHOUMETO Emmanuel.[1,4], AHOKPE Mélanie.[1] , BABA-MOUSSA Lamine Saïd[3], SEZAN Alphonse.[1]

1. Laboratoire de Biomembranes et de Signalisation Cellulaire, Département de Physiologie Animale, Faculté des Sciences et Techniques, Université d'Abomey-Calavi, 09 BP 196 Cotonou (Bénin)
2. Laboratoire d'Etude et de Recherche en Chimie Appliquée, Ecole Polytechnique d'Abomey-Calavi , Université d'Abomey-Calavi, 01 BP 2009 (Bénin)
3. Laboratoire de Biologie et de Typage Moléculaire en Microbiologie. Département de Biochimie et de Biologie cellulaire, FAST, Université d'Abomey-Calavi 05 BP 1604 (Bénin)
4. Service de Nutrition. Centre de santé Notre Dame des Sœurs de Ouidah. BP : 66 Ouidah (Bénin)

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Corresponding Author

YESSOUFOU Abdou Ganiou

Abstract

Background: Metabolic syndrome is a particular state of disease characterized by the association of morphological, physiological and biochemical abnormalities that evolve over time, predisposing the individual suffering with atherosclerosis and its complications

Goal: The objective of this work is to study the metabolic syndrome in the obese population of Ouidah

Materials and methods

This study involved 72 patients seen in consultation at nursery center in Ouidah for overweight. Anthropometric parameters (weight, height, Body Mass Index Underweight, Waist) were measured. The biochemical parameters (blood glucose, triglycerides, HDL-Cholesterol and Cholesterol total) were assayed. The IDF criteria (2005) were used to diagnose metabolic syndrome. The information gathered was analyzed using different software.

Results

The results showed that more than ¾ of patients or 79% had the metabolic syndrome. Among those affected, all had abdominal obesity, 86% had hypertension, 72% had higher blood sugar than or equal to 1.5 g / l and 46% had dyslipidemia, 56% hypertriglyceridemia and 36% a HDL-Cholesterol low

Conclusion

The prevalence of metabolic syndrome is high among the obese population of Ouidah, and the main factor contributor was abdominal obesity

INTRODUCTION

Metabolic syndrome is a particular state of disease characterized by the association of morphological, physiological and biochemical abnormalities that evolve over time, predisposing the individual suffering with atherosclerosis and its complications (Viswanathan et al,. 2006). According to IDF, the metabolic syndrome appears in most cases due to excessive accumulation of abdominal fat. So waist circumference has been recognized as a good marker of abdominal fat and intra-abdominal (Pouliot et al., 1994). The prevalence of metabolic syndrome depends on its definition, the year of study, age, sex, ethnicity of the population studied. In France, some studies (DESIRE) conducted in France showed a prevalence of metabolic syndrome by 16% in men and 11% in women (Balkau et al.,

2003); against by others (MONICA) showed a prevalence of 22.5% in men and 18.5% in women (Gamila et al., 2003). In the US, metabolic syndrome affects 24% of the adult population (Ford et al., 2002). Despite the scientific interest in the metabolic syndrome made it predisposes to type 2 diabetes and cardiovascular disease, few studies have been devoted to Africa in particular in Benin. The present study aims at determining the metabolic syndrome in patients seen in consultation for overweight Nursery Centre in Ouidah.

MATERIALS AND METHODS

This is a descriptive and analytical prospective study conducted among patients seen in consultation for obesity in Ouidah Nursery Center of August 2014 and January 2015. Thus, 72 consenting patients regardless of gender, older than 18, and with overweight were selected. To diagnose Metabolic Syndrome, we used the IDF criteria (Zimmet et al., 2005; Alberti et al., 2009) which requires the presence of 3 of the following 5 criteria including abdominal obesity: waist circumference greater than 94 cm in men and greater than 80 cm in women, blood pressure greater than or equal to 130/85 mm Hg or antihypertensive treatment, triglycerides greater than or equal to 1.5 g / l, HDL cholesterol less than 0.4 g / l in men and less than 0.5 g / l in females or specific treatment underway, glucose fasting greater than or equal to 1 g / l or antidiabetic therapy in progress.

The variables studied were 3 orders

- Independent variables : age, sex, occupation, and residence
- Clinical variables: weight, height, BMI, waist circumference and blood pressure
- The measurement of the waist and weight gain was used to determine the BMI which was defined as weight in kg divided by the square of height in meters. The distribution of patients by BMI category was made according to the official classification recognized by the WHO: BMI <18.5 Malnutrition; 18.5 <BMI <24.9 normal nutritional state; 25 <BMI <29.9 Overweight; 30 <BMI <34.9 Obesity (Class I); 35 <BMI <39.9 mass Obesity (Class II); BMI> 40 Morbid obesity (class III).
- The waist circumference measurement was made using a ribbon and was used to assess the anatomical distribution of fat. Waist circumference was measured on the patient standing midway between the anterior superior iliac spine and the last costal margin on the midaxillary line
- Measuring blood pressure
  - Paraclinical variables: We have taken blood sample by venous puncture from near of the elbow of patient who have eaten nothing since 12 hours. Classic enzymatique methods were used to measure total cholesterol, HDL-Cholesterol, triglycerides and glucose rate in blood.

  The materials used are:
- for taking anthropometric measurements: portable scale 120kg range (CAMRY brand), measuring rod for size and tape measure to the waistline
- We used different reagent kits for enzymatic assay of Total Cholesterol (code: 80106), the HDL-Cholesterol (code: 86536), triglycerides (code: 80019) and glucose (code: 80209 LP), all BIOLABO SA France brand with expiration date 3/2016);

The information gathered was analyzed with help of Word, Excel and SPSS 12.0 for windows. We used the chi-square statistical test to compare our results with significance for $p < 0.005$. Data were reported as mean ± standard deviation (SD)

The study was carried out following the authorization number 8285 / MS / DC / DNSP / BSS August 5, 2014 Head of the Centre. We obtained informed consent from patients verbally and we explained the utility of making the determination of biological parameters to detect different metabolic abnormalities. The benefit for patients is the reduction of obesity and the complications

RESULTS

Of a total of 72 obese subjects received consultation; female patients were the most represented with a sex ratio of 0.36. The average age of the study population was 51.43 years ± 12.78 years. The distribution of patients according to BMI showed that 19% of patients were overweight, 56% had class I obesity, massive obesity 17% and 8% were morbidly obese (Figure 1). The mean BMI was 33,13kg / m2 ± 4.81 kg / m2. The average waist size was 103.66 ± 10.61 cm for women and 104.46 ± 10.54 cm in men. In this work we assayed the levels of triglycerides, total cholesterol, HDL-cholesterol and blood glucose. The average values of different biochemical parameters are: glucose 1.40 g / l ± 0.86; Triglycerides 1.29 g / l ± 0.40; Cholesterol-total 2.06 g / l ± 0.47; HDL-Cholesterol Women: 0.57 g / l ± 0.20 Man: 0.52 g / l ± 0.16. We collected 79% of patients with metabolic syndrome with at least 3 of 5 criteria of IDF. This condition is mainly expressed in male patients with 84% against 77% among females. The distribution of patients with the metabolic syndrome according to the IDF criteria showed that all patients had

abdominal obesity; 72% of them had a blood glucose above or equal to 1 g / l; 56% had a higher triglycerides or equal to 1.5 g / l; 36% had HDL cholesterol levels low, and 86% had hypertension (Figure 2). Criteria Abdominal obesity and hypertension were more frequent in our patients with metabolic syndrome

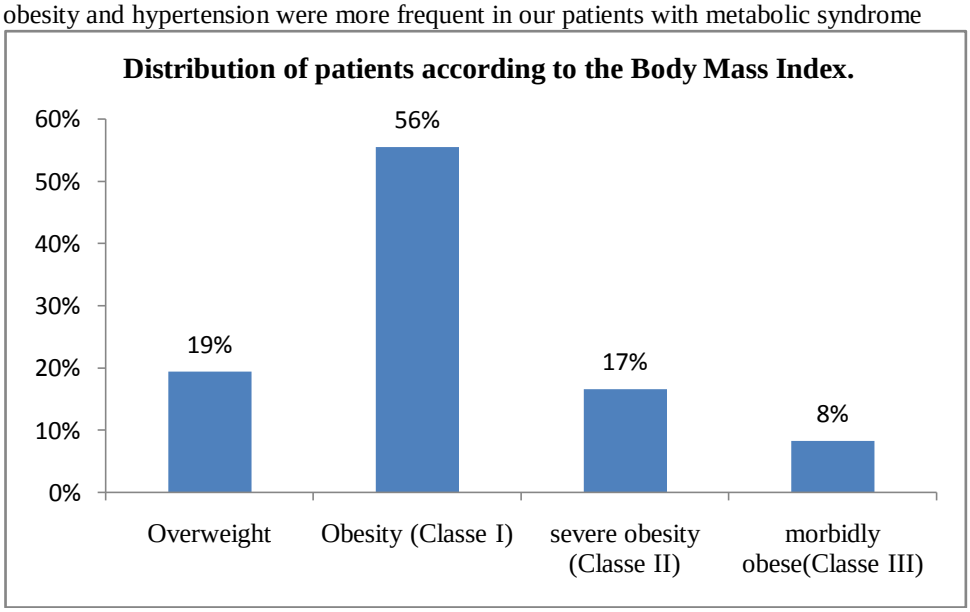

Fig 1: Distribution of patients according to BMI

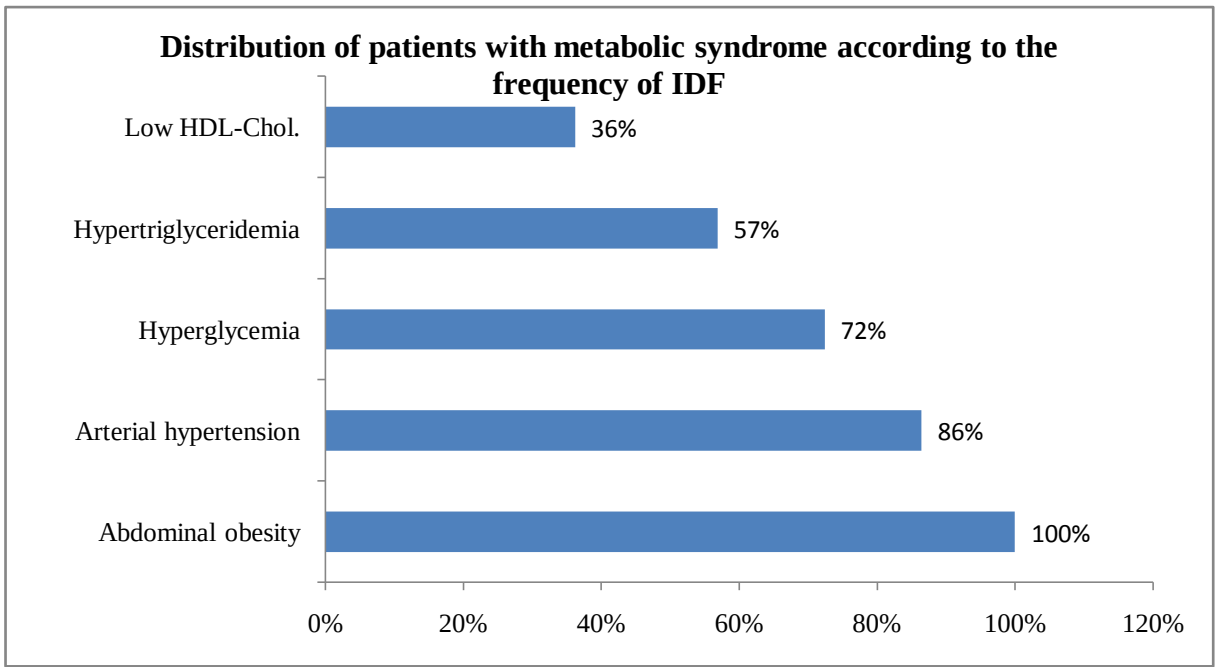

Fig 2 : Distribution of patients with metabolic syndrome according to the frequency of IDF.

DISCUSSION

The 72 subjects included in the study, were divided into 19 males and 53 females or a sex ratio of 0.36. The average age of the study population was 51.43 years for a standard deviation of 12.78 years. Increasing age is a vulnerability of metabolic syndrome. Numerous studies in the literature have shown variability of metabolic syndrome according to age. Indeed, the frequency of occurrence of metabolic syndrome is high in the advanced stages of life this is probably related to the fact that these seniors are sedentary and are exposed to complications related to diabetes and obesity. This assumption is comforted by the DESIRE study (Balkau et al., 2003) which reveals an increase in the prevalence of metabolic syndrome with age.

81% of our patients were obese, including 17% had a massive 8% of obesity and morbid obesity. 84.48% of patients with metabolic syndrome have a BMI greater than or equal to 30 kg / m2. These results are superior to those of Bréhima (2009) and Traore (2008) who found 64.70% and 30.3% respectively. This difference is explained by the clinical characteristics of each study population.

The prevalence of metabolic syndrome in the study population was 79%. It is close to that of the authors Dang Thi Man et al., (2013) 72.3% of which is paid to the study obese patients with sleep apnea syndrome. This prevalence is higher than that of the author as Bréhima (2009) (68%) who did his study on diabetic patients who used the same IDF criteria like us. Our results are well above those authors like FORD et al. (2002) (44%), Ozen et al., (2011) (47.2%) who used other metabolic syndrome definition of criteria that reduce the prevalence

Metabolic syndrome is mainly expressed in male patients is 84%. This result is consistent with those of Balkau et al., (2003) and Gamila et al., (2003) which showed a predominance of the metabolic syndrome in humans. However, it is easy to note as Andreelli et al., (2006) that the metabolic syndrome is also common in men than in women after menopause

Metabolic syndrome involved 77% of women in our study population; this result is slightly higher than Traore (2008) which was 73.3% using the same definition of SM given by the Idf (2005). This slight difference could be explained by the small size of our sample. Moreover, these results are better than those of Coste (2006) and Ginsberg et al., (2003) who were 17.9% and 10% respectively using the definition NCEP-ATP III. These differences in results may be explained by our choice of the IDF definition, which offers tour of standards lower size (≥ 94 cm for men and ≥ 80 cm for women); causing an increase in frequency relative to other definitions.

All patients had metabolic syndrome abdominal obesity is 100%. Bréhima (2009) and Traore (2008) found 95.6% and 83.3% respectively in their study. This could be explained by the clinical characteristics of the participants in our study who are already obese. The distribution of patients with metabolic syndrome according to the frequency of IDF criteria showed that abdominal obesity was the most common which allows us to think that abdominal obesity is the main contributor of the Metabolic Syndrome in our study population. This review joins that of Lameira et al., (2008) who have had to make the same observation in the population of the United States. Abdominal obesity measured by waist circumference becomes an indispensable prerequisite for the diagnosis of MS according to the Idf (2005). The waist measurement is the most sensitive diagnostic criterion and is a very good screening test of the SM, easy to perform and inexpensive.

In our study, 86% of patients affected by metabolic syndrome had hypertension which is equivalent to the results found by Traore (2008) is 86.7%. Our result is higher than 66% obtained by Tichet et al., (2005) who used the same criteria as we IDF. This difference could be explained by the limited sample size.

Among our patients affected by metabolic syndrome, 56% had a higher triglycerides or equal to 1.5 g / l. The average triglyceride level was 1.29 g / liter ± 0.40 g / l. Bréhima (2009) and Traore (2008) regained 41.2% and 26.7% respectively. HDL-Cholesterol Low involved 36% of patients with the metabolic syndrome. The average HDL-Cholesterol ratio is 0.57 g / l ± 0.20 g / l in women and 0.52 g / l ± 0.16 g / l in men. Bréhima (2009) found 29.4%. These increases may be due to genetic dominance, physical inactivity and eating habits of our patients study population age with an average age of 51.43 ± 12.78 years.

We identified in our study 72% of patients affected by metabolic syndrome had higher blood sugar than or equal to 1 g / l. The average glucose level was 1.4 g / l with a standard deviation of 0.86 g / l. These results are below those found by Traore (2008) 90% and Bréhima (2009) or 100% who have realized their study on diabetic patients.

Conclusion

At the end of our study, we have determined the importance of metabolic syndrome in the obese population of the town of Ouidah. A female predominance is noted in the study population with a sex ratio of 0.36. The average age was 51.43 years with a standard deviation of 12.78. The prevalence of metabolic syndrome was very high in this population, more than three quarters (79%) of obese patients seen for consultation Nursery

center were met. The distribution of patients with metabolic syndrome according to the frequency of IDF criteria showed that abdominal obesity was the most common which allows us to affirm that it is the main contributor of the Metabolic Syndrome in our study population. The management of different risk factors through education, good monitoring of diet and adequate physical activity, will significantly reduce metabolic syndrome and moreover the risk of cardiovascular disease and the occurrence of diabetes type 2.

REFERENCES

Andreelli, F., Jacquier, D. (2006): Le syndrome métabolique chez la femme. Angeiologie ; 58 : 15-17

Alberti, K.G.M.M., Robert, RH., Grundy, S.M., Zimmet, P.Z., Clecman, J.I., Donato, K.A., Fruchart, J.C., James, W.P.T., Loris, C.M. et Smith, S.C. (2009): Hormonizing the metabolic syndrome. A Joint Interim Statement of International Diabetes Federacart Association, World heart federation: Internation artherosclerosis Society; and international Assocation for the Study of odesity. Circulaire, 120 : 1640-1645

Balkau, B., Vernay, M., Mhamdil, L., Novak, M, Arondel, D. et Vol, S. (2003): The incidence and persistence of the NCEP (National Cholesterol Education Programm) metabolic syndrome. The French D.E.S.I.R Study. Diabetes Metab. 29 : 526-532

Brehima, B. (2009) : Etude de la prévalence du syndrome métabolique dans la population diabétique de Bamako et l'influence du régime alimentaire et de l'activité physique dans la prise en charge de ces patients. Thèse de Médecine ; université de Bamako, Mali. pp 79

Coste, M. (2006) : Prévalence du syndrome métabolique chez les patients de 30- 64 ans durant un mois de consultation. Thèse de Médecine. Université de Lyon, France. 19

Dan Thi Mai, K. et Tran Van, N. (2013) : Etude sur la prévalence du syndrome métabolique chez les patients atteints du syndrome d'apnées de sommeil. J fran Viet Pneu , 04 (10) : 36-42

Deepa, M., Farqooq, S. et Datta, M. (2006): Prevalence of metabolic Syndrome using WHO, ATP III and IDF definitions in Asian Indians: The Chennai Urban Rural Epidemiology Study (CURES-34). Diabetes Meta Res Rev (in press)

Ford, ES., Giles, WH. et Dietz WH. (2002): Prevalence of the metabolic syndrome among US adults: finding from the third National Health and Nutrition Examination Survey, JAMA ; 287: 356-359

Gamila, S., Dallongeville, J. (2003): Epidémiologie du syndrome métabolique en France. Med. Nutr., 39 : 89-94

Ginsberg, H.N. et Stalenhoef, A.F. (2003) : The metabolism syndrome : targeting dyslipidaemia to reduce coronary risk. J Cardiovasc Risk ; 10 : 121-128

Lamera, D., Lejeune, S. et Mourad, J.I. (2008) : Le syndrome métabolique : son épidémiologie et ses risques. Annales de dermatologie 135, Supplément 4 : 8249-8253

Ozen, K.B., Sarac, F., Sarac, S., Uluer, H. et Yilmaz, C. (2011) : Metabolic Syndrome insulin resitance, fibrinogen, hemocysteine, leptin, and C-reative protein in obese patients with obstructives sleep apnea syndrom ; Ann. Thorac. Med., 6 (3) : 120-125

Pouliot, M.C., Despres. J.P. et Lemieux, S. (1994) : Waist circumference and abdominal sagittal diametor ; best simple anthropometric indexes of abdominal visceral adipose tissue accumulation and related cardiovascular risk in men and women. Am J. Cardiol., 73: 460-468

Traoré, A. (2008) : Etude sur le syndrome métabolique en médecine interne du CHU DU POINT G Thèse de Médecine. Université de Bamako, Mali. pp 67

Tichet, J., Vol. S. (2005) : Fréquence du syndrome métabolique et de ses anomalies selon les définitions du NCEP-ATP III, de l'IDF et de l'AHA/NHLBI chez 19126 hommes et 18874 femmes âgées de 20 à 74 ans de 2002 à 2004. Diabetes Care, 28 : 1769-78

ViswanathanI, M. et Deepa, M. (2006) : Syndrome métabolique dans les pays en developpement. Diabetes Voice ; 51: Numéro spécial: 15-17

Zimmet, P., Alberti, L. G. et Shaw, J. (2005): Nouvelle définition globale du syndrome métabolique. Diabetes Voice ; 50, (3) : 31-33