

Prevalence of Metabolic Syndrome in the Medical-Surgical Emergency Department of the Donka National Hospital

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Abstract

Introduction: The metabolic syndrome (MS) corresponds to the coexistence of several metabolic disorders including three (3) factors out of five (5) in the same individual. These five (5) major criteria are central or abdominal obesity, hypertriglyceridemia, low High-Density Lipoprotein cholesterol (HDLc), hyperglycemia, and elevated blood pressure. It has been the subject of various definitions over the past 10 years. It is a clinical-biological entity recognized by the World Health Organization (WHO) in 1998, the National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATP III) in 2001, the International Diabetes Federation (IDF) in 2005, then the IDF Harmonization Consensus in 2009. The objective of this study was to determine the prevalence of metabolic syndrome in the medico-surgical emergency department of the Donka national hospital. **Methods:** This was a descriptive study, data collection took place from February 5 to July 5, 2022 and, covering all patients aged 16 and over, without distinction of sex, origin received in consultation in the medical unit in the emergency department of Donka and having agreed to participate in the study. Anthropometric, clinical and biological data were recorded. **Results:** We recruited 107 patients whose age ranged from 20 to 94 years with a mean age of 58.92 ± 13.78 years. The prevalence of metabolic syndrome in our study population was 6.30% with a female predominance of 73.83%. The most frequent components of the metabolic syndrome were abdominal obesity (100%) followed by hyperglycemia (85.98%) and hypertension (85.05%). Among the complications related to the metabolic syndrome, diabetes was found with (46.73%), hypertension (43.93%) and stroke (16.93%). **Conclusion:** Our results show a significant prevalence of the metabolic syndrome and its main complications, which were diabetes,

hypertension and stroke. These data justify early detection and treatment strategies.

Keywords

Prevalence, Metabolic Syndrome, Medicine Unit, Donka National Hospital

1. Introduction

The metabolic syndrome (MS) corresponds to the coexistence of several metabolic disorders including three (3) factors out of five (5) in the same individual. These five (5) major criteria are central or abdominal obesity, hypertriglyceridemia, low High-Density Lipoprotein cholesterol (HDLc), hyperglycemia, and elevated blood pressure [1]. It has been the subject of various definitions over the past 10 years. It is a clinical-biological entity recognized by the World Health Organization (WHO) in 1998, the National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATP III) in 2001, the International Diabetes Federation (IDF) in 2005, then the IDF Harmonization Consensus in 2009 [2] [3] [4]. Worldwide, the prevalence of MS varies between 12% and 22.6% in young people and between 9% and 35% in adults. This prevalence depends on the definition of the metabolic syndrome used, the region, the design of the study, the year of the study, the age group and the target population [5] [6]. In the United States, metabolic syndrome affects 24% of the adult population [7]. In France, some studies estimated a prevalence of 16% in men and 11% in women [8]. In Africa, this prevalence is 79% in Benin within the obese population of the Commune Ouidah in the South-West and estimated at 51% in Côte d'Ivoire among hypertensives at the Abidjan cardiology institute [9] [10]. In Guinea, this prevalence was evaluated at 56% in 2012 in a population of type 2 diabetics [11]. The high frequency of metabolic syndrome in the emergency department and the lack of epidemiological data concerning it in our country motivated the choice of this study. The aim of this study was to assess the prevalence of metabolic syndrome in the medical and surgical emergency department of the Donka National Hospital.

2. Methods

This was a descriptive cross-sectional study, carried out from February 5 to July 5, 2022. We included in this study all patients aged 16 and over, without distinction of sex, origin and who met the criteria for IDF definition of 2005, is the presence of at least 3 of the 5 criteria after free and informed consent, namely:

- Abdominal obesity: corresponding to a waist circumference greater than or equal to 94 cm in men and 80 cm in women; (mandatory criterion)
- A triglyceridemia greater than or equal to 1.50 g/l (or 1.7 mmol/l) and/or taking a specific lipid-lowering treatment;

- An HDL-cholesterol level less than or equal to 0.40 g/l (1.03 mmol/l) in men and 0.50 g/l (1.29 mmol/l) in women and/or taking specific lipid-lowering treatment;
- Hypertension, defined by blood pressure greater than or equal to 130/85 mm Hg and/or taking antihypertensive treatment;
- High fasting blood sugar, greater than or equal to 1 g/l (5.6 mmol/l) or anti-diabetic treatment.

Pregnant women or patients with a pathology responsible for an increase in abdominal circumference (ascites, tumour, hernia) or secondary arterial hypertension were excluded from this study.

The variables were qualitative and quantitative divided into epidemiological, clinical and paraclinical data;

The data was collected using a standardized questionnaire which included epidemiological, clinical and paraclinical parameters which was pre-tested on a small group of patients then adjusted and validated by the head of department. The study questions were administered in French or in the local languages according to the language commonly spoken by the patient and the meaning of the words was explained (in French) or translated into the national language by the investigator.

Data were entered using EPI data version 3.1 software and then exported to SPSS version 21 for analysis and for the comparison of the proportions we used Fisher's exact test and the Chi-square test. The statistically significant difference was fixed for a p-value < 0.05.

Limits and difficulties: the main difficulty encountered during this study was the non-performance of certain biological assessments by all the patients, such as: total cholesterol, LDL, HDL, triglycerides.

Ethical consideration: before any administration of the questionnaire; the informed consent of each patient was requested; the validity of the work was explained beforehand; we reassured them of the respect of anonymity in the restitution of the data.

3. Results

See **Tables 1-3** and **Figure 1** and **Figure 2**.

4. Discussion

This study was carried out in the medical unit at the medical-surgical emergency department of Donka National Hospital. During this study, we recruited 107 patients for a metabolic syndrome with a prevalence of 6.30%. Cisse *et al.* in 2020 in Senegal [12] had reported in their study a prevalence of 6.57%, On the other hand higher prevalence had been found in India (35.8%) [13] and in the United States (23.7%) [7]. The differences observed with these countries could be related to the more affluent diet and lifestyle which are factors favoring a sedentary lifestyle and obesity.

Table 1. Features socio-demographics of survey participants in the medical unit in the medical-surgical emergency department of the Donka national hospital: there was a clear female predominance with a difference of (73.83%) against (26.17%), the predominant age group was 56 - 65 years old, with an average of 58.92 ± 13.78 years old. 56.07%.

Sociodemographic characteristics	Effective	Proportion (%)
SEX		
Feminine	79	73.83
Male	28	26.17
AGE GROUPS		
16 - 25 years old	1	0.93
26 - 35 years old	5	4.67
36 - 45 years old	13	12.15
46 - 55 years old	17	15.89
56 - 65 years old	40	37.38
66 - 75 years old	20	18.69
75 and over	11	10.28
ACCORDING TO THE RESIDENCE		
Conakry (urban)	83	76.6
Outside Conakry (rural)	24	22.4
LEVEL OF EDUCATION IN FRENCH		
Unschooler	60	56.07
Primary	8	7.48
Secondary	15	14.02
Superior	24	22.43

Table 2. Distribution of patients according to the complications associated with the metabolic syndrome observed in the medical unit in the medical-surgical emergency department of the Donka national hospital: patients with a metabolic syndrome were received for a complication of diabetes, is 46.73%.

Complications of Metabolic Syndrome	Workforce N = 107	Proportion (%)
Diabetes	50	46.73
hypertension	47	43.93
stroke	18	16.93
Hypertensive encephalopathy	2	1.87
Hypertensive heart disease	4	3.74
MCD	5	4.67
Dyslipidemia	11	10.28
SCA	2	1.87
AOMI	1	0.93
Others*	3	2.80

*: malignant hypertension (2) and IR (1).

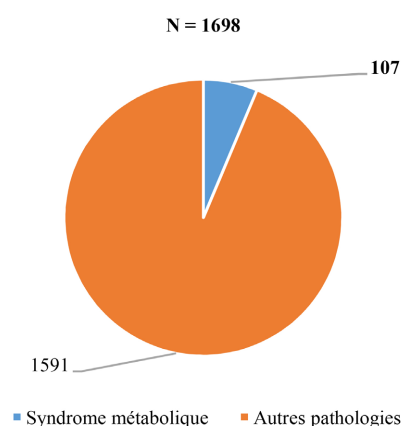


Figure 1. Prevalence of metabolic syndrome in the medical unit of the medical-surgical emergency department of Donka National Hospital: we recruited 107 patients for a metabolic syndrome with a prevalence of 6.30%.

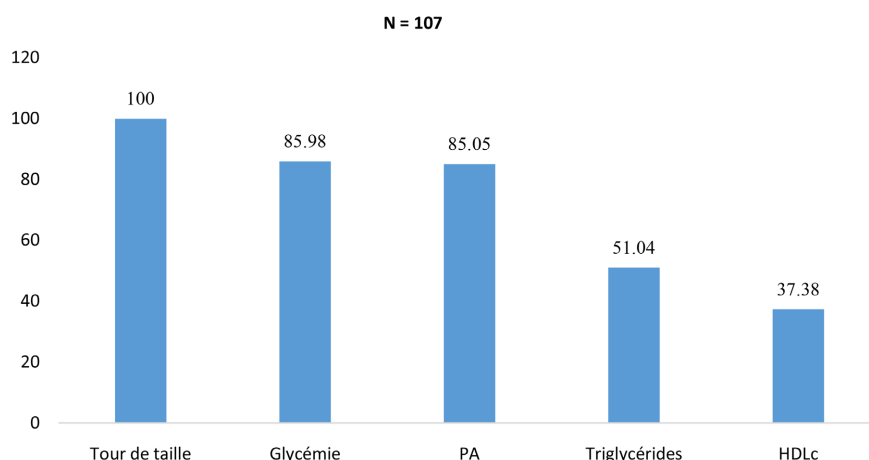


Figure 2. Distribution of patients according to the frequency of metabolic syndrome criteria in the medical unit of the medical-surgical emergency department of Donka National Hospital: all patients with metabolic syndrome presented with abdominal obesity, is 100%.

Table 3. Relationship between BMI and gender, HDLc, blood sugar and triglycerides: There was a significant relationship between body mass index and gender.

Variables	p-value (p < 0.05)
BMI and gender	0.014
BMI and HDL cholesterol	0.066
BMI and blood sugar	0.059
BMI and triglycerides	0.108

During our study, there was a female predominance with a difference of (73.83%). Osuji *et al.* [14] in 2012 in Nigeria reported a female predominance of 47.6%. The low level of physical activity was associated with this study and could be explained by the low motivation of women to be physically active. Maintain-

ing regular moderate physical activity prevented the risk of metabolic syndrome occurring, by improving metabolic capacity and weight loss [15].

In our series, the predominant age group was 56 - 65 years, with an average of 58.92 ± 13.78 years, Diallo *et al.* [11] in Guinea among type 2 diabetics found a mean age of 56 ± 9.8 years. This increase in the prevalence of the metabolic syndrome with age is therefore in line with the data in the literature; it could be linked to the higher frequency of metabolic disturbances in the elderly. However, the emergence of the metabolic syndrome in adolescents should be noted, as evidenced by studies carried out in the United States and Canada, according to these authors, obesity would play an essential role [16].

We found a higher frequency of patients residing in urban areas (Conakry) at 77.57%. This could be explained by the impact of lifestyle in urban areas (nutritional transition, industrialization, lifestyle, etc.) on the frequency of the metabolic syndrome.

In our study, patients with metabolic syndrome were received for complications, namely: complication of diabetes (46.73%), high blood pressure (43.93%) and stroke (16.93%), these complications were found in other studies, Marceline *et al.* in 2014 in Ouagadougou (Burkina Faso) [17], N'Guetta *et al.* in 2016 in Ivory Coast [10] who had respectively found diabetes (48.9%), stroke (11.1%). Admittedly, the causes have not been fully elucidated during this study, but factors related to lifestyle, such as eating habits and lack of physical activity are largely incriminated. This explains the need to screen for the different components of this syndrome in order to ensure comprehensive management of the comorbidities diagnosed, including modifiable risk factors. This care, in addition to the various drug treatments (antidiabetics, lipid-lowering, antihypertensives), should include an appropriate diet and regular physical activity. Zeber *et al.* [18] had shown that careful attention to diet and medication reduced the risk of occurrence of cardiovascular events by 39% to 44%.

5. Conclusion

The prevalence of metabolic syndrome was high in the medical unit at the medical-surgical emergency department of Donka National Hospital. Diabetes was the main complication associated with this syndrome. The management of this metabolic syndrome requires emphasizing the proper monitoring of diet and physical activity in addition to drug treatment for a significant improvement in the various parameters. Periodic large-scale studies on the general population are promising avenues for highlighting the prevalence of the metabolic syndrome in our country.

Conflicts of Interest

We declare that we have no conflict of interest in relation to this article.

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Appendices

SURVEY SHEET

No.: Date:/...../2022

1) GENERAL INFORMATION

- Age (in years): Gender: M ; F
- Marital status: Married ; Single ; Divorced ; Widowed .
- Occupation: Housewife ; Pupil/Student ; Merchant ; Civil servant ; Workers (re) ; Others:
- Residence: Conakry ; Excluding Conakry .
- Level of education: no schooling ; primary level ; secondary level ; higher level .
- Way of life:
 - Tobacco: Yes ; No . If yes, quantity in pack year:
 - Chronic smoking (1 packet/day/year) quantity in packet year:
 - Alcohol: Yes ; No ; If yes, the quantity:
 - Chronic alcoholism (30 g/d/year):

2) HISTORY AND RISK FACTORS

BACKGROUND:

a) Personal

Medical:

Surgical:

b) Family:

c) Collateral:

CVRF:

HTA ; Diabetes ; Dyslipidemia ; Smoking ; Alcoholism ;

Obesity ; Sedentary lifestyle ; stress .

Others:

3) CLINICAL DATA:

Reasons for consultation:

Loss of consciousness ; Dyspnea ; throbbing ; Neurological deficit ; IMO ; Headaches ; Dizziness ; polyuria polydipsia syndrome; Gonalgia .

Other (s) to be specified:

Physical examination:

General condition: Good ; Medium ; Altered .

If impaired WHO performance index =

Weight =kg

Size =cm

BMI =kg/m²

Waist =cm

BP =/.....mmHg

Pulse =p/min

FR =c/min

Temperature = °C.

SpO₂ =%

Consciousness: SG =/15

Other (s) to be specified).....

4) PARACLINICAL DATA

Fasting blood sugar.....g/l

Triglycerides.....g/l

Total cholesterol.....g/l

HDLc.....g/l

LDLc.....g/l

5) DIAGNOSTIC.....

6) BECOME OF THE SICK

Hospitalized

Released/outpatient

Deceased