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Metabolic Syndrome in Ambulatory Rheumatology Consultation in the City of Brazzaville, Congo

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Abstract

Objective: To describe the epidemiological and diagnostic profile of patients with metabolic syndrome seen in ambulatory rheumatology consultations. **Materials and method:** Descriptive cross-sectional study, conducted on the medical records of patients seen in outpatient clinics (Medical House France-Congo), from January 2022 to December 2023. Metabolic syndrome (MS) was defined according to NCEP/ATP III 2005 (National Cholesterol Education Program/Adult Treatment Panel). The study variables were epidemiological and diagnostic. **Results:** Of the 1149 patients seen during the study period, 183 (15.9%) had metabolic syndrome. The feminine gender predominated (64.5%) with a sex ratio of 0.5. The mean age was 57.1 ± 10.5 years (extremes 30 and 77 years). Metabolic syndrome was associated with osteoarticular disease in 57.4% of cases (n = 105). Of these, 62.9% were women. Their mean age was 59.5 ± 11 years. The main factors constituting metabolic syndrome were BMI (90.9%), high blood pressure (83.6%) and the dyslipidemia (58.1%). Metabolic syndrome predominated in degenerative diseases (71.4%), mainly common low back pain (44%) and knee osteoarthritis (30.6%). It was associated with inflammatory rheumatism in 28.6% of cases, in particular gout (53.3%) and rheumatoid arthritis (33.3%). **Conclusion:** Metabolic syndrome is frequent during rheumatic diseases seen in ambulatory rheumatology consultations. It was mainly of interest to patients seen for degenerative rheumatism.

Keywords

Metabolic Syndrome, High Blood Pressure, Diabetes Mellitus, Obesity,

Rheumatology, Brazzaville

1. Introduction

The metabolic syndrome is characterized by visceral obesity, insulin resistance, hypertriglyceridemia, low levels of high-density lipoprotein (HDL) and high blood pressure [1]. Over the past decades, its prevalence has risen considerably, mainly due to the increase in risk factors such as a sedentary lifestyle and modern living habits [2]. This trend is compounded by the surge in obesity, diabetes and high blood pressure, making metabolic syndrome a major public health issue [3] [4]. The coexistence of these conditions appears to exacerbate systemic inflammation, contributing to a worsening of rheumatologic symptoms and a marked deterioration in patients' quality of life. Several studies have highlighted a strong association between metabolic syndrome and certain rheumatic diseases, particularly osteoarthritis, rheumatoid arthritis and gout [5] [6]. As the first point of contact for the management of rheumatic diseases, ambulatory rheumatology consultations is a privileged opportunity to screen for and manage metabolic syndrome effectively. In sub-Saharan Africa, and particularly in Congo, data on the prevalence and impact of metabolic syndrome in patients seen in ambulatory rheumatology consultations remains scarce. This study was therefore conducted to describe the epidemiological and diagnostic profile of patients with metabolic syndrome seen in ambulatory rheumatology consultations.

2. Materials And Method

This was a cross-sectional study conducted from January 1, 2022, to December 31, 2023. The France-Congo Medical Center (FCMC), a healthcare establishment, served as the setting for the study. It is a private health establishment located in the Moungali district of Brazzaville, the capital city of the Republic of Congo [7]. The FCMC provides specialized healthcare service in Rheumatology, as well as in Physical and Rehabilitation Medicine, Cardiology, Neurology, Endocrinology, Hepato-Gastroenterology and General medicine. It has an in-house medical biology laboratory capable of performing standard laboratory tests, including blood glucose and complete lipid profile, as well as a medical imaging unit, equipped for standard radiography and medical ultrasonogrphy. The study included medical records of patients aged over 18 years, presenting with metabolic syndrome and seen exclusively in Rheumatology consultation only. The medical records of patients seen in non-specialized rheumatology consultation were not included. The diagnosis of metabolic syndrome was based on the criteria of the National Cholesterol Education Program Adult Treatment Panel III (NCEP-ATPIII), revised in 2005, which defines metabolic syndrome as the presence of at least three of the following criteria [8]:

- Abdominal obesity: defined by a body mass index (BMI) ≥ 30 kg/m^2, associ-

ated with a waist circumference > 94 cm in men and >80 cm in women;

- Fasting triglyceride levels > 1.7 mmol/l (>150 mg/dl);
- HDL-cholesterol < 1.03 mmol/l (40 mg/dl) in men and 1.29 mmol/l (50 mg/dl) in women, according to the International Diabetes Federation;
- Systolic blood pressure > or = 130 mm Hg and/or diastolic blood pressure > or = 85 mmHg;
- Fasting plasma glucose level > 6.1 mol/l (110 mg/dl).

The study variables included epidemiological (age, sex, frequency), clinical (height, weight, BMI, waist circumference, blood pressure), diagnostic (type of rheumatic disease) and biological data related to the measurement of metabolic syndrome markers. The data processing and statistical analysis were performed using SPSS software version 20. Quantitative variables were expressed as a mean ± standard deviation or as percentages. Comparisons between Categorical variables were performed using the Chi-square test with a significance threshold set at 5%. This study was conducted with strict compliance for anonymity and confidentiality requirements.

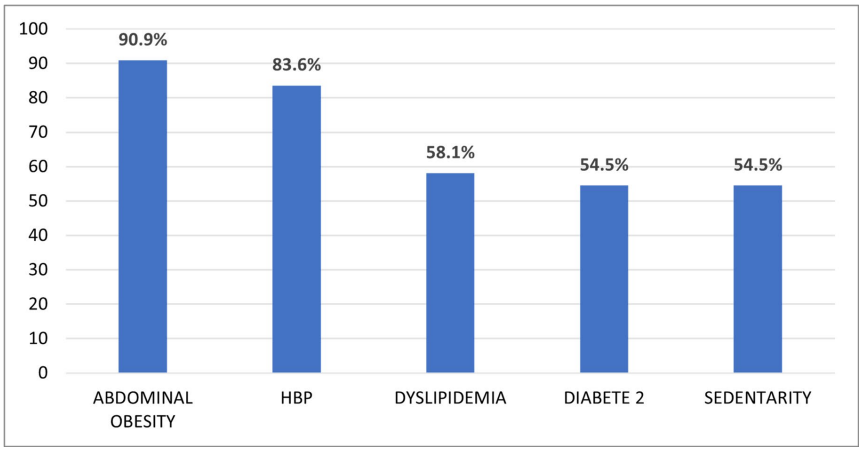
3. Results

During the study period, 1149 patients were seen in ambulatory rheumatology consultation across all medical disciplines. Of these, 183 presented with metabolic syndrome, a frequency of 15.9%. There were 118 women (64.5%) and 65 men (35.5%), giving a sex ratio of 0.5. The mean age was 57.1 ± 10.5 years, with extremes of 30 and 77 years. Metabolic syndrome (MS) was associated with osteoarticular disease in 57.4% of cases (n = 105), involving 66 women (62.9%) and 39 men (37.1%), *i.e.* a sex ratio of 0.5. The mean age of patients with metabolic syndrome was 59.5% ± 11 years. Table 1 shows the mean value of factors associated with metabolic syndrome (MS). Of the 105 patients with MS, 42.9% had four NCEP-ATP III criteria. The main factors constituting metabolic syndrome were BMI, high blood pressure and dyslipidemia (Figure 1). The rheumatic disease associated with metabolic syndrome was degenerative rheumatism in 71.4% (n = 75), mainly common low back pain (44%). The main degenerative conditions associated with SM are shown in Figure 2. The rheumatic disease associated with metabolic syndrome was inflammatory rheumatism in 28.6% of cases (n = 30). These are presented in Figure 3.

Table 1. Average value of factors associated with metabolic syndrome, according to the revised NCEP-ATP III classification.

Value	Average ± SD	Average ± SD	P
	Men (n = 40)	Women (n = 65)	
Age (years)	59.3 ± 6.7	59.6 ± 13.02	0.000
BMI (kg/m²)	28.7 ± 2.8	29.8 ± 3.7	0.005
Waist size (cm)	106.3 ± 6.1	91.9 ± 12.8	0.251
Glycemia (g/l)	1.5 ± 0.4	1.6 ± 0.6	0.025
HDL(g/l)	44.1± 7.2	39.7 ± 7.3	0.672
Triglyceride (g/l)	155.0 ± 7.2	149.8 ± 7.3	0.137

SD: Standard deviation.



HBP: High Blood Pressure.

Figure 1. Frequency of associated factors with metabolic syndrome.

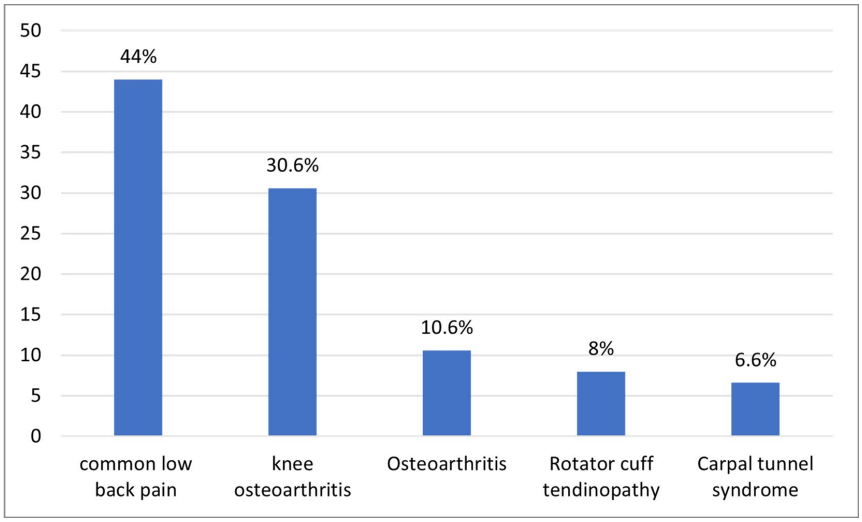


Figure 2. Degenerative rheumatic diseases associated with MS.

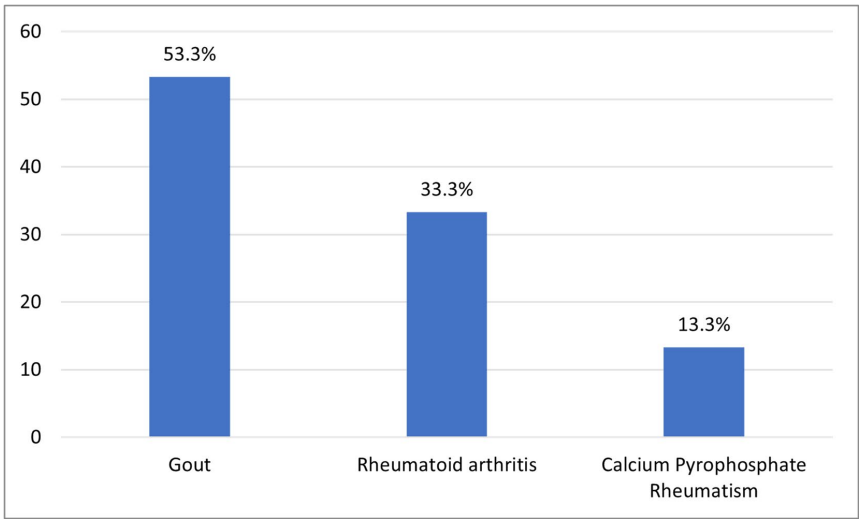


Figure 3. Inflammatory rheumatic diseases associated with MS.

4. Discussion

The concept of metabolic syndrome has been widely developed in medicine in recent years, particularly in cardiology and endocrinology, primarily as an indicator of cardiovascular risk [9]. In sub-Saharan Africa, the prevalence of metabolic syndrome in the population remains poorly documented. According to the work of Fofana *et al*. in Burkina Faso, it appears to be relatively uncommon [10]. Changes in the eating behavior of populations, particularly in urban settings, and a sedentary lifestyle, strongly associated with the explosion of high blood pressure and type 2 diabetes mellitus on the continent, suggest a likely increase in metabolic syndrome prevalence in the coming years [11] [12]. In rheumatology, the high incidence of obesity, high blood pressure and diabetes mellitus in rheumatic diseases, particularly degenerative diseases, has prompted rheumatologists to explore the role of metabolic syndrome in patients with rheumatic diseases [13]-[15]. In the Republic of Congo, no previous studies have specifically investigated metabolic syndrome in patients consulting for rheumatologic conditions. This first study, which analyzed the medical records of patients seen in ambulatory rheumatology consultation, due to its retrospective nature, does not allow us to generalize our results or assess the impact of metabolic syndrome on the risk of developing rheumatic diseases. This methodological choice also limits the statistical power of our data due to potential information bias. However, it provides an opportunity to clarify the role of metabolic syndrome in rheumatology.

As an emerging public health issue in sub-Saharan Africa, metabolic syndrome appears relatively frequent in our series. Indeed, it was observed in approximately one out of six patients across all specialties. Among them, nearly 60% were seen in rheumatology consultation, underscoring the common occurrence of metabolic syndrome in rheumatic diseases. These results are consistent with those of Savadogo *et al*. in Burkina Faso [16]. The role of metabolic syndrome in the onset and severity of joint degeneration has been increasingly investigated, especially in osteoarthritis and certain chronic inflammatory rheumatic diseases such as rheumatoid arthritis. Low-grade inflammation secondary to metabolic syndrome appears to be the key underlying mechanism [13] [17]. Its more frequent occurrence in women and elderly individuals is classic, the prevalence of metabolic syndrome increasing with age [18]. The existence of a rheumatic disease does not change these facts in our series. Indeed, women represented two-thirds of patients with metabolic syndrome associated with a rheumatic disease. The average age of onset, regardless of gender, reflects the role of age as a relevant factor in metabolic syndrome [19]. The sedentary lifestyle and dietary changes associated with reduced mobility from musculoskeletal impairment, may explain the high frequency of obesity and high blood pressure as associated factors of metabolic syndrome in our series [20]. Osteoarthritis, the most common rheumatic disease, constituted the pathological framework in which metabolic syndrome predominated in our series, particularly in common low back pain and knee osteoarthritis. The association of osteoarthritis and metabolic syndrome is well known today. The pathophysiology of metabolic osteoar-

thritis involves both cumulative effect of metabolic diseases, Yoshimura *et al*. demonstrated a threefold increased risk of radiographic progression with the presence of three metabolic risk factors—as well as independent effects of each component [21]. Indeed, obesity, in addition to increasing mechanical stress on the joints, is the cause of low-grade inflammation, through the production of pro-inflammatory mediators, particularly adipokines (leptin), implicated in the structural severity of osteoarthritis. Hyperglycemia and insulin resistance are thought to be the cause of pro-inflammatory and oxidative activity at the joint level mediated by glycation products and oxidative stress. High blood pressure is thought to act by promoting atherosclerosis of the vascularization of the subchondral bone. The role of dyslipidemia is not well defined, but there is a significant link between dyslipidemia and osteoarthritis, well demonstrated during digital osteoarthritis [13]. The management of these factors during the treatment of osteoarthritis constitutes, in our context of insufficient technical platform and therapeutic means, a major imperative to limit structural progression, preserve joint function and relieve the patient. However, osteoarthritis is not the only pathological situation associated with metabolic syndrome in our series. In approximately 30% of cases, there was a metabolic syndrome in patients followed for inflammatory rheumatism, in particular gout and rheumatoid arthritis, two of the rheumatic diseases among the most frequent causes of arthritis in hospitals in Congo [22]. The most common metabolic inflammatory rheumatism in the world, gout in our series, as in Western studies, was frequently associated with metabolic syndrome [23]. Obesity, which is common in gout, is an independent risk factor for hyperuricemia, which is itself a risk factor for developing diabetes mellitus and high blood pressure [24] [25]. In Congo, these factors are common in gout, particularly high blood pressure (multiplies the risk of gout by 6), explaining our results [14]. For rheumatoid arthritis, the situation is different from that of gout. The presence of metabolic syndrome in rheumatoid arthritis has been shown to be linked to disease activity [17]. In sub-Saharan Africa, RA is diagnosed late, at the stage of joint deformation and destruction. The inaccessibility of innovative therapies makes achieving remission difficult. Patients thus retain low to moderate disease activity and therefore an increased risk of associated metabolic syndrome. In addition to systemic inflammation, during rheumatoid arthritis, the systematic use of long-term corticosteroid therapy to control disease activity also increases the risk of developing metabolic syndrome in our patients. [26] [27].

5. Conclusion

Metabolic syndrome is common in rheumatic diseases seen in ambulatory rheumatology consultation. It mainly affects the adult of advanced age and female gender. Metabolic syndrome primarily affects patients being treated for common low back pain and knee osteoarthritis. It can also be found in patients being treated for inflammatory rheumatism, but less frequently, particularly in gout and rheumatoid arthritis. Its effective management is crucial both to prevent cardiovascular risk

in rheumatic diseases and to improve their structural and functional prognosis. It involves popularizing, among patients, hygiene and dietary measures to combat obesity and overweight, but also joint-saving measures and measures to combat a sedentary lifestyle and physical inactivity, taking into account the patient's joint and functional capacities at the time of metabolic syndrome diagnosis.

Conflicts of Interest

The authors declare no conflicts of interest.

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