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# Etiological Profile of Arthritis at the Teaching and Departmental Hospital Oueme-Plateau of Porto-Novo

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**Abstract:** Introduction: Arthritis is common in rheumatology and has a large number of causes. Our goal in this study was to find out the etiological profile of arthritis in the rheumatology unit of the Teaching and Departmental Hospital Oueme-Plateau. Methods: This was a cross-sectional, descriptive, and analytical study, with retrospective collection, on the files of patients who consulted the rheumatology unit of the Teaching and Departmental Hospital Oueme-Plateau of Porto-Novo, from May 2015 to September 2021. All patients with arthritis were included. The data collected were recorded and analyzed using EPI INFO software version 7.2. Results: Out of 2416 records, 68 patients presented with arthritis, i.e., a hospital frequency of 2.8%. The mean age was 49.3 ( $\pm$  16.9) years with extremes of 5 and 80 years. The majority were women (60.3%) with a sex ratio of 0.7. These patients were hypertensive in 42.6% of cases and diabetic in 10.3% of cases. The non-specific biological inflammatory syndrome was present in 75.5% of the 53 patients who underwent these explorations. Polyarthritis was present in most cases (52.9%), followed by monoarthritis (26.5%). The most recurrent etiological groups were autoimmune causes (38.8%), microcrystalline (35.8%), and infectious (14.9%). Rheumatoid arthritis was the most frequent cause (36.8%), followed by gout (25.0%), chondrocalcinosis (10.3%), tuberculosis (7.3%), septic arthritis (4.4%), and mixed spondyloarthritis (4.4%). Autoimmune causes were the first etiological group in women (52.5%) and microcrystalline causes were the first etiological group in men (59.3%), with a statistically significant difference ( $p = 0.010$ ). Conclusion: The causes of arthritis in the Teaching and Departmental Hospital Oueme-Plateau are multiple, but are dominated by autoimmune, microcrystalline, and infectious causes.

**Keywords:** Arthritis, Autoimmune, Porto-Novo, Infectious, Microcrystalline

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## 1. Introduction

Arthritis is quite common in rheumatology. Their occurrence in Black Africa is little investigated. The hospital prevalence of inflammatory arthropathy in a study conducted

in Libreville was 2.7% [1]. In Benin, arthritis often poses a diagnostic problem. Indeed, the etiological research can be burdensome, especially because of the large number of

causes, but a rigorous and methodical diagnostic approach often allows to find it. In view of this frequent occurrence and the multiplicity of causes, we conducted this study with the goal of determining the etiological profile of arthritis in the rheumatology unit of the Teaching and Departmental Hospital Ouémé-Plateau of Porto-Novo (Benin). This research will allow us to have an extensive view of the causes of arthritis in our environment.

## 2. Methods

This was a cross-sectional, descriptive, and analytical study, with retrospective collection, on the records of patients who consulted the rheumatology unit of the Teaching and Departmental University Hospital Ouémé-Plateau of Porto-Novo, from May 2015 to September 2021. We included in this study the patients, whatever their age and sex, received in consultation of rheumatology and in whom the positive diagnosis of arthritis was made. Sampling was exhaustive by systematic recruitment of patients meeting the inclusion criteria. Data were collected from the patients' medical records and recorded on an individual data collection form prepared in accordance with the objectives of the study. Data were collected on the patient's general information (age, sex, occupation, monthly income, level of education), history (personal and family, recent and past), clinical signs (functional, general, and physical) and paraclinical signs (biological, radiological, joint fluid examinations), diagnoses retained, and treatments instituted. Confidentiality of the data was guaranteed. After data collection, the survey forms were analyzed, and each form was checked. The data collected were recorded and analyzed using EPI INFO software version 7.2. Tables and graphs were created using Word and Excel software. A p-value of less than 0.05 was considered the threshold of significance.

## 3. Results

### 3.1. Frequencies

Out of 2416 records, 68 patients had arthritis, i.e., a hospital frequency of 2.8%.

### 3.2. Characteristics of the Study Population

The mean age was 49.3 ( $\pm$ 16.9) years with extremes of 5 and 80 years. Women were in the majority (60.3%) with a sex ratio of 0.7. These patients were hypertensive in 42.6% of cases and diabetic in 10.3% of cases (Table 1).

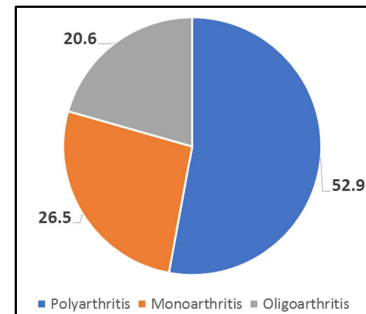
**Table 1.** General population characteristics.

Variables	Population n=68
Average age (years)	49.3 (5-80)
Age group (%)	
<40	17 (25.0)
40-60	32 (47.1)
>60	19 (27.9)
Sex (M/F) (%)	39.7/60.3
High blood pressure (%)	29 (42.6)
Obesity (%)	15 (22.1)
Diabetes (%)	07 (10.3)

### 3.3. Characteristics of Arthritis

Most cases were polyarthritis (52.9%), followed by monoarthritis (26.5%).

The non-specific biological inflammatory syndrome was present in 75.5% of the 53 patients who underwent these explorations and microcytic anemia was present in 22.8% of cases.



**Figure 1.** Distribution of patients with arthritis by the number of joints affected.

### 3.4. Etiological Profile

The most frequent etiological groups were autoimmune causes (38.8%), microcrystalline (35.8%), and infectious (14.9%) (Table 2).

**Table 2.** Distribution of patients with arthritis according to etiological groups.

Etiological groups	Frequency (%)
Autoimmune diseases	26 (38.8)
Microcrystalline arthritis	24 (35.8)
Infectious arthritis	10 (14.9)
Autoinflammatory diseases	04 (6.0)
Undetermined causes	02 (3.0)
Tumor diseases	01 (1.5)

Rheumatoid arthritis was the most common etiology (36.8%), followed by gout (25.0%), chondrocalcinosis (10.3%), and tuberculosis (7.3%) (Table 3).

**Table 3.** Distribution of patients with arthritis by etiology.

Etiologies	Polyarthritis	Oligoarthritis	Monoarthritis	Total
Rheumatoid arthritis	23 (63.9)	1 (7.1)	1 (5.6)	25 (36.8)
Gout	6 (16.7)	4 (28.6)	7 (38.9)	17 (25.0)
Chondrocalcinosis	0	3 (21.4)	4 (22.2)	7 (10.3)
Tuberculosis	0	2 (14.3)	3 (16.7)	5 (7.3)
Septic arthritis	0	2 (14.3)	1 (5.6)	3 (4.4)
Mixed Spondylitis	3 (8.3)	0	0	3 (4.4)
Reactive arthritis	2 (5.6)	0	0	2 (2.9)

Etiologies	Polyarthritis	Oligoarthritis	Monoarthritis	Total
Systemic lupus	1 (2.8)	0	0	1 (1.5)
Psoriatic arthritis	1 (2.8)	0	0	1 (1.5)
Juvenile arthritis	0	1 (7.1)	0	1 (1.5)
Prostatic adenocarcinoma	0	1 (7.1)	0	1 (1.5)
Undetermined	0	0	2 (11.1)	2 (2.9)
Total	36	14	18	68

**3.5. Analytical Study**

**3.5.1. Etiological Group and Age**

Autoimmune causes represented the first etiological group in subjects under 40 years of age (58.8%) and microcrystalline arthritis which was the first etiological

group in subjects over 40 years of age (48.4% for subjects between 40 and 60 years of age and 47.4% for those over 60 years of age). The difference was statistically significant with  $p=0.0257$  (Table 4).

*Table 4. Distribution of patients with arthritis by etiology group and age.*

	Frequency (%)			p
	<40 ans	40-60 ans	> 60 ans	
Autoimmune diseases	10 (58.8)	10 (32.3)	06 (31.6)	0.0257
Microcrystalline arthritis	00 (00.0)	15 (48.4)	09 (47.4)	
Infectious arthritis	06 (35.3)	03 (09.7)	01 (05.3)	
Autoinflammatory diseases	01 (05.9)	02 (6.5)	01 (05.3)	
Tumor diseases	00 (00.0)	00 (00.0)	01 (05.3)	
Undetermined causes	00 (00.0)	01 (03.2)	01 (05.3)	

**3.5.2. Etiological Group and Sex**

Autoimmune causes were the first etiological group in women (52.5%) and microcrystalline causes were the first etiological group in men (59.3%). The difference was statistically significant with  $p=0.010$  (Table 5).

*Table 5. Distribution of patients with arthritis according to etiological group and gender.*

	Frequency (%)		p
	Men	Women	
Autoimmune diseases	05 (18.5)	21 (52.5)	0.0102
Microcrystalline arthritis	16 (59.3)	08 (20.0)	
Infectious arthritis	04 (14.8)	06 (15.0)	
Autoinflammatory diseases	01 (03.7)	03 (07.5)	
Tumor diseases	01 (03.7)	00 (00.0)	
Undetermined causes	00 (00.0)	02 (05.0)	

**3.5.3. Etiological Group and Other Factors**

We did not notice a statistically significant association between the etiological group and:

- 1) diabetes ( $p=0.4412$ );
- 2) high blood pressure ( $p=0.7417$ );
- 3) obesity ( $p=0.6789$ ).

**4. Discussion**

In the current study, the hospital incidence of arthritis was 2.8%. In Gabon, Nzenze JR *et al* [1] found a hospital prevalence of inflammatory arthropathy of 2.7%. It indicates the relative frequency of these conditions in black Africa. The mean age in our study was 49.3 ( $\pm 16.9$  years) with extremes of 5 and 80 years. Our patients seem relatively young. This relative youth is only a reflection of the general

demography of a developing country [1]. Women were in the majority (60.3%) with a sex ratio of 0.7. Other authors have found a male predominance [1, 2]. Our patients were hypertensive in 42.6% of cases and diabetic in 10.3% of cases. This prevalence of diabetes mellitus is like that found by Dghaies A. *et al* [3], which was 10%, but their study was carried out in patients who had septic arthritis instead. Diabetes mellitus being a cause of immunosuppression, could therefore increase the risk of septic arthritis and therefore explain the increased prevalence in patients with arthritis. Regarding the number of joints affected, polyarthritis was present in most cases (52.9%), followed by monoarthritis (26.5%). Oligoarthritis was the least represented with a frequency of 20.6%. Non-specific biological inflammatory syndrome was present in 75.5% of patients and microcytic anemia was present in 22.8% of cases. Inflammatory anemia was observed in 61.3% of patients with rheumatoid arthritis in Cotonou, according to Zomalheto Z *et al* [4]. This frequency of anemia is probably related to the inflammation creating an iron detour at the origin of a microcytic anemia [4]. The most frequent etiological groups were autoimmune causes (38.8%), microcrystalline (35.8%), and infectious (14.9%). In the study by Nzenze JR *et al* [1], metabolic arthritis, especially gout, was the leading cause (31.6%) followed by systemic disease (17.5%). Rheumatoid arthritis was the most common etiology (36.7%), followed by gout (25.0%), chondrocalcinosis (10.3%), tuberculosis (7.3%), septic arthritis (4.4%), and mixed spondyloarthritis (4.4%). Rheumatoid arthritis is a chronic autoimmune inflammatory disease with a worldwide prevalence of 0.24% and an annual incidence of 20-45 per 100,000 people [5]. In Cotonou, its hospital prevalence was 1.02% according to Zomalheto Z *et al* in 2015 [4]. In our study, gout was the second cause of

arthritis. According to Richette P et al [6] gout is the most common inflammatory arthritis. Gout is more common in blacks in the United States [7], which may be related to an increased frequency of hypertension, or lower income, influencing diet and the frequency of obesity [8]. In this US population, the prevalence of gout was indeed inversely correlated with income, contrary to the traditional view of gout as the disease of the "rich and powerful" [8]. Autoimmune causes represented the first etiological group in subjects under 40 years of age (58.8%) and microcrystalline arthritis which was the first etiological group in subjects over 40 years of age (48.4% for subjects between 40 and 60 years of age and 47.4 for those over 60 years of age). The difference was statistically significant with  $p=0.0257$ . Autoimmune causes (especially rheumatoid arthritis) represented the first etiological group in women (52.5%). Rheumatoid arthritis is the most common chronic inflammatory rheumatism, and often affects women of childbearing age [9-11]. In the study by Zomalheto Z et al in 2015[4], female predominance was also observed. The effect of estrogen on the occurrence of rheumatoid arthritis (RA) seems to be complex and dependent on the woman's age and ovarian stage. Similarly, the results concerning the involvement of endogenous exposure (age at menarche, age at menopause, number of pregnancies) and exogenous exposure (oral contraception, hormone replacement therapy) on the occurrence of RA are controversial in the literature [12]. Microcrystalline causes (especially gout) were the leading etiological group in men (59.3%). The difference was statistically significant with  $p=0.010$ . The prevalence of gout was higher in men than in women in all age groups, although this male predominance decreased with age [7, 8]. Due to the uricosuric effect of estrogens, uricemia is lower in adult women than in men until menopause [13], when women's uricemia reaches the value of men. Gout thus occurs later in women than in men.

Chondrocalcinosis was the third cause of arthritis in our study (10.3%). Articular chondrocalcinosis (ACC) designates *stricto sensu* a calcification of the articular cartilages. More generally, this term usually refers to calcifications due to encrustation of articular cartilage or fibrocartilage by calcium pyrophosphate (CPP) dihydrate, and seen on standard radiography [14]. CPP microcrystals can cause acute arthritis. In the general population, these attacks of pseudogout seem about half as frequent as gout attacks. But in the elderly, ACC is the most common cause of acute arthritis. Attacks are sometimes triggered by trauma, by various acute illnesses including myocardial infarction or by local or general surgery, and in particular by parathyroid surgery [14]. We should also mention a few clinical facts reporting the onset of pseudo-gouty attacks following infusions of bisphosphonates [15], joint lavage [16] or intra-articular injections of hyaluronan [17].

Furthermore, we did not note any association between the etiological group and the diabetic, hypertensive, and obese status of the patients.

## 5. Conclusion

The hospital frequency of arthritis was high in our study. Their causes were numerous, but are dominated by autoimmune, microcrystalline, and infectious causes. Autoimmune causes represented the first etiological group in women and microcrystalline causes the first etiological group in men. This leads us to adopt a rigorous and hierarchical diagnostic approach to a case of arthritis, the only way for us to optimize the chances of finding the causes of arthritis in our country where our patients have very limited financial means.

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