

# Asymptomatic Cardiac Manifestations in Rheumatoid Arthritis in Conakry (Guinea)

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## Abstract

**Introduction:** Rheumatoid arthritis (RA) is the most common chronic inflammatory rheumatic disease. It is a systemic disease with extra-articular manifestations that can be life-threatening. In sub-Saharan Africa, there is little published information on cardiovascular manifestations in RA. **Objective:** The objective is to determine the asymptomatic cardiac manifestations during rheumatoid arthritis in Conakry. **Patients and Methods:** This was a cross-sectional study lasting 6 months from January 1, 2020 to June 30, 2020 in the rheumatology and cardiology departments of the Ignace Deen National Hospital. Patients with RA diagnosed according to the 2010 ACR/EULAR criteria, asymptomatic at the cardiovascular level, which had an ECG and echocardiography, were included in the study. Left ventricular diastolic dysfunction was considered in any patient with an E/A ratio < 1, an E/E' ratio > 10, and an LVEF = 50%, assessed by the Simpson biplane method and classified according to Redfield. Epidemiological, clinical and paraclinical data were analyzed using SPSS statistics 21.0 software. **Results:** Seventeen cases of rheumatoid arthritis (5.9%) were collected. There was a predominance of women with 14 cases (82.4%). The mean age of patients was  $48.2 \pm 11.9$  years. The average duration of RA was  $7.2 \pm 4.2$  years. Cardiovascular risk factors were dominated by overweight and obesity (58.8%) and sedentary lifestyle (35.3%). RA was predominantly high activity (DAS 28  $\geq 5.1$ ) in 82.4% of patients. Anti-CCP antibodies were positive in 76.9% of cases. Fourteen patients (82.4%) had abnormal cardiac results. The electrocardiogram showed left atrial hypertrophy in 29.4% of cases, left ventricular hypertrophy (11.8%) and ventricular extrasystole (11.8%). The cardiac Doppler scan showed diastolic dysfunction of the left ventricle (47.1%) and moderate pericardial effusion in 11.8% of cases. **Conclusion:** The study found asymptomatic cardiac manifestations of

rheumatoid arthritis. They were dominated by ventricular hypertrophy on electrocardiogram and left ventricular diastolic dysfunction on cardiac Doppler ultrasound. Systematic examination of patients with RA is necessary to detect them early and avoid complications.

## Keywords

Rheumatoid Arthritis, Asymptomatic Manifestations, Electrocardiography, Sub-Saharan Africa, Guinea

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## 1. Introduction

Rheumatoid arthritis (RA) is the most common chronic inflammatory rheumatic disease affecting approximately 0.5% - 1% of the world's population [1]. The overall prevalence in sub-Saharan Africa can be estimated at 0.3% [2]. It is a systemic disease with numerous extra-articular manifestations [3], some of which may be life-threatening, with cardiovascular involvement being the most common [4]. The cardiovascular risk of RA is now well documented and represents the primary excess mortality factor in this disease [5] [6]. The cardiovascular risk in RA is mainly related to the chronic inflammatory state which leads to numerous metabolic changes [7]. Asymptomatic cardiac manifestations are common in RA, but are not routinely investigated. Specific cardiac involvement in RA is often asymptomatic and discovered by ultrasound or autopsy [8]. In Africa, there are very few publications on cardiovascular manifestations during rheumatoid arthritis. In Senegal, in 2011, Ndongo S *et al.* found 36.5% of asymptomatic patients with at least one abnormality on ECG or electrocardiography [4]. In 2016, another study found that 16.9% of patients had a cardiovascular risk factor (CVRF) and many abnormalities were found on cardiac Doppler ultrasound in asymptomatic RA patients [9]. In Algeria, in 2020, the study of cardiovascular risk (CVR) in RA recommends a systematic assessment of CVR in patients in routine practice and the management of classical CVR [10]. According to Meryem M *et al.*, the use of corticosteroids in the management of RA is responsible for cardiovascular disease due to the accumulation of risk factors [11]. The objective of this study was to describe asymptomatic cardiac manifestations during rheumatoid arthritis in Conakry.

## 2. Patients and Methods

It was a cross-sectional study lasting 6 months from January 1, 2020 to June 30, 2020. It was conducted in the rheumatology and cardiology departments of the Ignace Deen National Hospital. All patients diagnosed with rheumatoid arthritis according to the ACR EULAR 2010 criteria [12] who were asymptomatic at the cardiovascular level were included. It was comprehensive recruitment. Each patient was required to have an ECG and echocardiography. For each patient, clinical and paraclinical features of rheumatoid arthritis were sought after rheuma-

tologic examination. The devices used for the detection of cardiac manifestations were an electrocardiogram and an echo-Doppler allowing examination in time-motion (TM), two-dimensional, continuous, pulsed, color and tissue Doppler modes. The cardiac Doppler was performed and interpreted by the same cardiologist. Diastolic dysfunction was defined as: an E/A ratio less than 1, an E/E' ratio greater than 10, measured on the lateral wall, and an LVEF = 50% evaluated by the Simpson biplane method. According to the Redfield classification, dysfunction was normal ( $0.75 < E/A < 1.5$  and  $E/Ea < 10$ ;  $DT > 140$  ms), moderate ( $0.75 < E/A < 1.5$  and  $E/Ea > 10$ ;  $DT > 140$  ms), moderate ( $E/A = 0.75$  and  $E/Ea < 10$ ) or severe (severe  $E/A > 1.5$  and  $E/Ea > 10$ ;  $DT < 140$  ms).

Patients not included in the study were:

- With a known heart condition;
- With irregularly monitored high blood pressure (HBP);
- With symptoms suggestive of cardiovascular disease;
- With a cardiology treatment;
- Who did not give their consent.

The data were collected after careful questioning followed by clinical and paraclinical rheumatologic and cardiologic examinations. Those data were:

- Quantitative: age, duration of RA progression, Disease Activity Score 28 (DAS 28) which assesses the activity of rheumatoid arthritis in 28 joints [13]. RA is considered to be in remission if  $DAS\ 28 \leq 2.6$ ; mildly active if  $2.6 < DAS\ 28 \leq 3.2$ ; moderately active if  $3.2 < DAS\ 28 \leq 5.1$  and very active if  $DAS\ 28 > 5.1$ . Erythrocyte sedimentation rate (ESR), C reactive protein (CRP), rheumatoid factors (RF), anti-CCP antibodies, morning roll, number of painful joints, number of swollen joints, number of awakenings during the night, Visual Analogue Scale (VAS) which assesses the intensity of the patient's pain on a scale from 0 (no pain) to 10 (unbearable pain).
- Qualitative: gender, cardiovascular risk factors, electrocardiogram, cardiac echo-Doppler.

Data analysis was done using SPSS statistics 21.0. Categorical variables were expressed as numbers and percentages. The mean and standard deviation were calculated for quantitative data.

### 3. Results

Seventeen cases of rheumatoid arthritis were collected for a prevalence of 5.9%. Fourteen patients (82.4%) were predominantly female, with a sex ratio rate (M/F) of 0.21. The mean age of the patients was  $48.2 \pm 11.9$  years with extremes of 25 and 64 years. The mean duration of RA was  $7.2 \pm 4.2$  years. A family history of chronic inflammatory rheumatism (CIR) was found in 23.5% of patients (Table 1).

In the study the main cardiovascular risk factors were overweight and obesity (58.8%), physical inactivity (52.9%) and dyslipidaemia (23.5%) (Table 2).

On rheumatologic examination, the average number of painful joints was 7.8 and an average of 2.5 joints was swollen. The pain caused an average of 1.2 night

**Table 1.** Socio-demographic characteristics of patients with rheumatoid arthritis who were cardiovascular asymptomatic.

	No.	%
Gender		
Women	14	82.4
Male	03	17.6
Age		
25 - 34 years	2	11.8
35 - 44 years	5	29.4
45 - 64 years	4	23.5
Over 65 years	6	35.3
Family history of CIR		
Yes	4	23.5
No	13	76.5

Average age:  $48.2 \pm 11.9$  years; Average duration of RA evolution:  $7.2$  years  $\pm 4.2$  years.

**Table 2.** Distribution of patients according to cardiovascular risk factors.

	No.	%
Overweight/obesity	10	58.8
Sedentary lifestyle	9	52.9
Dyslipidemia	4	23.5
Diabetes	3	17.7
Smoking	1	5.9

awakenings. Six patients had morning stiffness duration of less than 15min. RA was highly active ( $DAS\ 28 \geq 5.1$ ) in 82.4% of patients. Biological inflammatory syndrome was present with accelerated SV in 82.4% of cases and positive CRP in 80% of cases. Immunologically, rheumatoid factors were positive in 86.7% of cases and anti-CCP antibodies were positive in 76.9%. Abnormal cardiac findings were observed in 14 patients (82.4%) (**Table 3**).

The electrocardiogram showed left atrial hypertrophy in 29.4%, ventricular extrasystole in 11.8%, left ventricular hypertrophy in 11.8% and QRS abnormalities in 5.9% (**Table 4**).

Cardiac Doppler abnormalities were dominated by left ventricular diastolic dysfunction (29.4%) which was mild for 5 patients (29.4%), moderate for 2 patients (11.8%) and very active for 1 (5.9%); and moderate pericardial effusion (11.8%) (**Table 5**).

#### 4. Discussion

The study focused on cardiovascularly asymptomatic rheumatoid arthritis (RA) patients. This was a preliminary study, the main difficulties of which were the

**Table 3.** Distribution of patients by clinical and biological characteristics of rheumatoid arthritis.

	No. (%)	M ± SD
Number of painful joints	-	7.8 ± 3.9
Number of swollen joints	-	2.5 ± 1.5
Night-time awakenings	-	1.2 ± 1.1
Duration of morning stiffness		
Any	1 (5.9)	-
<15 min	6 (35.3)	-
15 to 30 min	4 (23.5)	-
30 min to 1 hour	3 (17.6)	-
>1 hour	3 (17.6)	-
Visual Analogue Scale	-	4.8 ± 1.3
DAS* 28		
]3.2 - 5.1]	3 (17.7)	-
≥5.1	14 (82.4)	-
Accelerated ESR**	-	47.8 ± 24.6
Positive CRP***	12 (70.6)	
Positive RF****	13 (76.5)	
Positive anti-CCP*****	10 (58.8)	

\*DAS 28: Disease Activity score 28; \*\*ESR: Erythrocyte Sedimentation Rate; \*\*\*CRP: C reactive protein; \*\*\*\*RF: Rheumatoid factors; \*\*\*\*\*Anti CCP: Anti-cyclic citrullinated peptide antibody.

**Table 4.** Distribution of patients with RA according to the electrocardiogram data.

	No.	%
Left atrial hypertrophy	5	29.4
Left ventricular hypertrophy	2	11.8
Ventricular extrasystole	2	11.8
QRS abnormalities	1	5.9

**Table 5.** Distribution of RA patients according to cardiac Doppler data.

	No.	%
No abnormality	5	29.4
Left ventricular diastolic dysfunction	8	47.1
Mild	5	29.4
Moderate	2	11.8
Very active	1	5.9
Pericardial effusion	2	11.8
Mitral valve leak	1	5.9
Tricuspid leak	1	5.9

short study duration, small sample size, non-exhaustive biological investigations, reluctance of patients to undergo cardiological investigations and low socio-economic level. During the study period, the hospital incidence of RA was 5.9%. This frequency is lower than that reported in a previous Guinean study (7.9%) [13]. This may be due to the short duration of data collection. The mean age of patients was comparable to that found in Benin in 2015 ( $44 \pm 10.6$  years) [14]. This result could be explained by the fact that, according to the literature, RA most often affects women in the age group between 40 and 60 years [15] [16]. Female predominance was also reported in African literature [17] [18] [19]. These results corroborated the female predominance described in the literature, suggesting the involvement of hormonal factors [20] [21]. RA is a cardiovascular risk factor [10] [22] [23] [24]. This risk is mainly related to the chronic inflammatory state that is caused by numerous metabolic changes [7]. The cardiovascular risk factors found in this series were similar to those found in France [25]. Some traditional cardiovascular risk factors in RA patients may contribute to the increased cardiovascular morbidity and mortality observed in RA [26]. A Senegalese study [27] and a Togolese study [19] reported a short average duration of RA. The long duration of progression of RA in this study is explained by the delay of consultation in specialised structures and the use of traditional medicine. Electrocardiogram abnormalities were less specific than those found in the study by Goulenok TM *et al.* [25]. The exclusion of patients with a history of cardiovascular disease could explain this result. The propensity for left ventricular diastolic dysfunction corroborated the data in the literature which describes it as the most common cardiac event in RA patients without clinically evident cardiac events. It is thought to be related to the duration of disease progression and activity of RA [9] [28] [29]. Valvulopathies (2 cases; 11.8%) were more commonly reported by Sarraj R *et al.* [18] (35 cases; 37.6%). The small sample size of our study may explain this difference in results. The rarity of rheumatoid pericarditis has been reported by Anastasio M [30] in relation to the asymptomatic nature of rheumatoid pericarditis (2% to 4%) [7] [27].

## 5. Conclusion

In our study, we found asymptomatic cardiac manifestations of rheumatoid arthritis. They are of various kinds; highlighted by both electrocardiogram and cardiac echo-Doppler. This study, therefore, highlights the need for a systematic cardiac examination in patients with rheumatoid arthritis.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

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