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Research Article

# Cardiovascular damage during lupus in black African subjects

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## Summary

**Introduction:** Systemic lupus is a disseminated inflammation of the conjunctive tissue. Cardiovascular lesions are the first cause of morbidity and mortality in the course of that disease. These lesions are prevalent in 30 to 62% of cases, depending on whether the diagnostic tool is clinical, echocardiographic, or autopsic. Any part of the heart can be affected, yielding manifestations of pericarditis, endocarditis, coronary heart disease, conduction disorders, and rarely myocarditis.

**Objective:** Describe cardiac manifestations during the follow up of patients diagnosed with systemic lupus.

**Patients and Methods:** We conducted a transversal descriptive study over a period of 27 months, in the departments of Internal Medicine, Dermatology, and Cardiology of Yalgado Ouedraogo University Hospital of Ouagadougou. All patients diagnosed with systemic lupus according to the American College of Rheumatology criteria, and having done an EKG, a Holter EKG, or a transthoracic echocardiography, were included in the study. Data were collected from inpatient medical records, outpatient follow up registry and booklets.

**Results:** Cardiovascular lesions were prevalent in 7 cases (43.75%) out of 16 patients diagnosed with systemic lupus. Mean age of patients was 36 years, with extremes of 23 and 51 years. Only female patients were affected in our study. Cardiac manifestations were mainly benign pericarditis, heart failure, and conduction disorders.

**Conclusion:** Cardiovascular manifestations are frequent during the course of systemic lupus, and occur after few years of disease progression. Transthoracic echocardiography and EKG remain useful non-invasive explorations for the assessment of cardiovascular lesions, despite minor shortcomings.

## Introduction

Systemic Lupus (SL) is an autoimmune disease that is characterized by a disseminated inflammation of the conjunctive tissue, with cutaneous, joints, and visceral manifestations [1]. This is the most frequent and the most documented connective tissue disorder. Cardiovascular lesions are the first cause of morbidity and mortality during the course of systemic lupus. Their frequency varies from 30 to 62% of SL cases, depending on diagnostic tools (clinical signs, echography, or autopsy) [2]. All cardiac layers can be affected with manifestations of pericarditis, endocarditis, coronary heart diseases, conduction disorders, and myocarditis in a seldom way.



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Clinical studies on cardiovascular lesions during SL are rare in sub-Saharan Africa. None of such studies has been conducted in Burkina Faso until now. The purpose of our study was to describe cardiovascular lesions occurring through the course of the disease in YalgadoOuédraogo University Hospital (YOUH) of Ouagadougou in Burkina Faso.

## Patients and Methods

We conducted a retrospective and descriptive study over a 27-month period ranging from January 2012 to March 2014 in the YOUH departments of Cardiology, Internal Medicine, and Dermatology. All patients diagnosed with SL using the American College of Rheumatology (ACR) criteriawere included, given that they were followed up in the Internal Medicine or Dermatology departments of the YOUH and had at least an EKG, Holter EKG, or a transthoracic echocardiography (TTE). Data were collected from outpatients and inpatients medical records. Patients were seen in person when further information was needed.

Individual forms were used to collect data on epidemiological parameters, length of follow up, personal and familial past medical history, physical signs and para-clinical investigations such as EKG and echocardiography.

### Data entering and analysis

All data were computerized and analyzed using software such as Epi-Info version 7 and SPSS version 15.0.

## Results

Cardiovascular diseases were prevalent in 43.75% of patients (07 out of 16 patients) followed up for SL. Mean age of patients was 36 years with extremes of 23 and 51 years. All patients in our study population were female. Time length from diagnosis of SL to identification of cardiovascular lesions was of 6 years in average, with extremes of 3 months and 13 years. Past medical history revealed that three patients had hypertension and one patient had diabetes. Cardiovascular manifestations were dyspnea in 42.8% of cases and palpitations in 85.7% of cases. Hypertension occurred in one (01) patient after 8 years of lupus follow up. Two (02) patients developed heart failure (12.5%). Three (03) patients had pericarditis (18.7%) including one (01) with deep vein thrombosis and one (01) with ascites. We recorded one (01) death in a patient who combined multi-visceral lesions including pericarditis, ascites, heart failure, lupus nephritis and chronic kidney failure.

Electrocardiographic (EKG) data showed that fifteen (15) patients had a regular sinus rhythm with four (04) cases of left atrial hypertrophy and two (02) cases of left ventricular hypertrophy.Conduction disorders were noticed in three (03) patients : one (01) case of second degree atrio-ventricular block, one (01) case of left bundle branch block, and one (01) case of anterior hemi-block. Cardiac lesions were diagnosed through Echocardiography in five (5) patients (31.2%) suffering from SL.The following abnormalities were noticed : left ventricular chambers moderately dilated in two (02) patients with a diminished ejection fraction, pericarditis with moderate pericardial effusion in two (02) cases, combined atria dilation in one (01) case, grade I mitral regurgitation in three (03) cases, and grade II mitral regurgitation with altered valvular apparatus in one (01) case. Pulmonary arterial hypertension (PAH) was observed in four (04) patients diagnosed with SL including : three (03) were mild and one (01) was severe.

## Discussion

During the course of systemic lupus, 7 patients out of 16 (43.5%), developed cardiovascular manifestations. The first diagnostic of cardiac lesion during the course of SL, was made after 6 years of disease progression. Studies reported the presence of cardiac lesions in 30 to 62% of SL cases, depending on the diagnostic tool (clinical,

echocardiography, or autopsy), and pericarditis is even part of the 11 diagnostic criteria of the ACR. Kotokey in India, Estes in the USA, and Sari in Turkey reported respectively 32.9%, 19% and 38% of cardiac lesions prevalence, during SL. The cardiac lesions occurred after variable time length ranging from 3 to 15 years [3-5]. In Sub-SaharanAfrica, SL is the most documented connective tissue disorder [6], and cardiac lesions are diagnosed in 12 to 30% of cases [7-9]. In our study, only females were affected by SL.In African and Western publications, more than 85% of females are affected [6,9]. This could be due to hormonal factors, especially increased oestradiol level, known to be a major risk factor.

The mean age of SL onset was 36.5 years. Age range of 30 to 40 years is the favourite one for disease onset. Ouédraogo in Burkina Faso [8] reported a mean age of 38.2 years, while Kombate in Togo reported 32 years [9], and Delegny in Martinique 30 years [3]. Patients affected by SL, have globally high frequency of traditional cardiovascular risk factors (hypertension, diabetes, dyslipidaemia, age, sex, hyperhomocysteinaemia) [10]. In our study, threepatients with SL (18.75%) developed a cardiovascular risk factor; one casehad hypertension (6.25%) one casehad diabetes (6.25%), andone case had dyslipidaemia. Belaksir in Morocco [11] reported 32.3% of cardiovascular risk factors, including 13% of diabetes cases, 13% ofhypertension cases, and 6.7% of dyslipidaemiacases.

Hypertension occurring in the course of SL, can be symptomatic of renal failure secondary to lupus glomerular nephropathy. Corticoid therapy can induce hypertension in SL. Thus, 10 to 20% of patients on corticoid therapy shall develop hypertension. However, some cases of primary hypertension, probably linked to the SL in the absence of any other aetiology, can be encountered [12]. Pericarditis was the most frequent cardiac lesion noticed in our study, affecting 18.75% of the patients. The pericarditis was incidentally diagnosed in 2 cases over 3, through echocardiography, and fluid effusion was of moderate volume.Badui [9], Kotokey in India [4], and Belaksir in Morocco [2], reported respectively 39%, 21.9% and 30% of pericarditis cases during the course of SL. Pericardial lesion is frequent in SL, and usually occurs after some years of disease progression. In our study pericarditis was benign, andregressed under corticoid therapy. Pericarditis was associated to deep vein thrombosis in one case. That patient was in bed for cardiac failure, without any other thromboembolic risk factor. Deep vein thrombosis usually occur in the first year of SL diagnostic, because of the high thromboembolic risk getting up to 50%. Thesecomplications are reported in 9 to 19% of cases [12].

Heart failure was noticed in 12.5% of patients with SL, and represented 28.5% of all cardiac lesions. Dyspnoea and palpitations were the symptoms that led to the diagnostic of heart failure. Cardiac chambers were moderately dilated and severely hypokinetic, with impaired ejection fraction. Heart failure is a dreadful complication of myocardial lesion during SL, and the prevalence variesbetween8 to 14% [5,12,14]. On EKG, conduction disorders noticed in 18.75% of cases were the main anomaly, and accounted for 42.8% of all cardiac lesions. Patients with heart failure had left ventricular hypertrophy associated or not to atrial hypertrophy, or ectopic ventricular beat. No patient presented signs of coronary artery lesion.

Kotoley and et al. in India [4] reported 17.8% of electrical disorders in patients with SL. Those disorders included 8.2% of peripheral low voltage, 4.1% of atrial and ventricular hypertrophy, 2.7% ofsinus tachycardia, 1.4% of atrial fibrillation, and 1.4% of sinus bradycardia. Electrical manifestations normally occur in the course of SL [12]. Echocardiography helps to assess cardiac lesions. 71.4% of our patients had cardiac lesions detected on echocardiography, including18.75% of pericardial effusion, 14.2% of mitral valve alterations, and 28.5% of dilated myocardiopathy. Similarly, Kotoley and et al. in India [4] found echocardiographic anomalies in 32.9% of their patients, with 21.9% of pericarditis, 6.9%of PAH, and 6.9% of valvular lesions.

The onset the cardiac lesions is gradual and silent, symptomsoccurring at an advance stage of the disease [6]. Echocardiography and EKGas non-invasive investigations, are key tools for efficient follow up of patients with SL.

## Conclusion

Cardiac lesions in the course of SL, are frequent and occur after some years of disease progression. Females are mainly affected. Cardiac manifestations are essentially benign pericarditis, heart failure, and conduction disorders. A close monitoring of cardiac manifestations in SL, is needful for early detection and treatment of cardiovascular lesions. Thus, echocardiography and EKG are common non-invasive investigations used to assess cardiovascular state, despite some shortcomings.

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