Evaluation of Risk Factors in Cardiovascular Patients with Diagnosis of Systemic Lupus Erythematosus (SLE)

ORIGINAL

Edienny Augusta Tocantins Viana Lobato¹,
Fernanda Araújo Santos¹, Ana Rachel Koury Marinho¹,
Alvaro Alves Dos Santos Neto¹,
Suzana Maria Klautau Ferreira¹,
Renan Dos Santos Cortinhas¹, Giordana Pereira De Sousa¹,
Francisco De Almeida Teixeira Neto¹,
Vivianne De Paula Reis Guimarães¹,
Igor Nascimento Batista¹, Caio Nogueira Oliveira¹,
Priscila Nathyelly Dos Santos Graim¹,
Anderson Phelipe Dias Sabry Azar¹

¹ Universidade do Estado do Pará.
Belém, Pará, Brazil. Travessa Perebebuí,
nº2623, Belém. 66095-450 (Brazil).

Contact information:

Giordana Pereira de Sousa.

Address: Universidade do Estado do
Pará. Travessa Perebebuí, nº2623, Belém.
66095-450. Brazil

✉ giordanapsousa@gmail.com

Abstract

Background: prevalence of cardiovascular risk factors in lupic patients. This study aimed to evaluate the presence of cardiovascular risk factors in patients diagnosed with SLE in a Rheumatology Ambulatory, comparing groups with and without SLE nephritis.

Methods: a quantitative, observational and cross-sectional study was carried out during the period from November 2016 to June 2017. 86 patients were interviewed using specific protocol.

Conclusions: among the cardiovascular risk factors evaluated, systemic hypertension was more frequent in SLE patients (33.7%), followed by smoking (17.4%) and diabetes mellitus (5.8%). There was, however, no difference between the frequency of these comorbidities in the groups with and without lupus nephritis.

Keywords

Keywords: Systemic Lupus Erythematosus, Lupus Nephritis,
Cardiovascular Risk

Introduction

Systemic lupus erythematosus (SLE) is an autoimmune disease, with a multifactorial etiology and clinical manifestations related to the most diverse organs. Among these, nephritis, which is capable of progressing to chronic kidney disease, is associated with a higher risk of progression to cardiovascular diseases, as a consequence of damage to renal function [1].

In the general population, the risk of a cardiovascular event in 10 years can be assessed using the Framingham Cardiovascular Risk Score, which considers the main risk factors involved in the genesis of such pathologies, such as hypertension, dyslipidemia, diabetes and smoking. Disorders of cardiovascular origin are currently present as an important cause of mortality in this group of patients, bringing to the discussion the risk factors related to the genesis of such events, of high incidence in this particular population, such as, family antecedents of coronary disease, dyslipidemia, arterial hypertension, obesity, smoking, sedentarism and diabetes mellitus [2].

Lupus nephritis occurs in about 35% to 50% of SLE patients and has a strong association with systemic arterial hypertension (SAH). It results from an autoimmune response, which leads to the deposition of immune complexes at the glomerular level, with the main hypothesis of the resulting glomerular lesion being the activation of the complement system through its classical and alternative pathways [3]. Renal impairment is associated with progression to greater chronicity [4]. Thus, patients diagnosed with SLE with renal impairment have a higher risk of developing coronary diseases than the general population [5].

In SLE, renal failure due to lupus nephritis directly influences the development of cardiovascular complications and arterial hypertension itself, may play a role as an independent factor for the risk of renal disease establishment and evolution [6, 7]. There is, therefore, a higher prevalence of these risk

factors in SLE, and the care and special attention given to patients with lupus nephritis due to the repercussions that may arise from it, since the risk of cardiovascular events is higher in groups of patients with renal impairment, associated with high levels of proteinuria and creatinine, and detectable immunological alterations, such as the presence of anti-phospholipid antibodies [2, 8].

The survival of these patients is directly related to the control of modifiable risk factors, with early and adequate treatment, as well as periodic evaluation and exams, which can greatly reduce the morbidity and mortality of this group [9]. Effective control of factors predisposing to cardiovascular disease is beneficial in terms of the final prognosis of long-term lupus nephritis [10]. The aim of this study was to evaluate cardiovascular risk factors in patients diagnosed with systemic lupus erythematosus, correlating them with the presence of renal complications.

Methods

A quantitative, observational and cross-sectional study was carried out at the Rheumatology Ambulatory at Santa Casa de Misericórdia Foundation of Pará (FSCMPA) during the period of November 2016 to June 2017. Patient data were collected in a follow-up at a rheumatology ambulatory with a diagnosis of Lupus Erythematosus following Systemic Lupus International Collaborating Clinics - SLICC [11]. An interview was made at the time of the consultation, as well as the completion of the instrument for data collection and clinical evaluation performed at the outpatient unit by the research team students. The laboratory tests used were brought to the outpatient clinic by the patients.

Results

The search results are distributed in the following three tables:

Table 1. Epidemiological characteristics of SLE patients according to the presence and absence of nephritis in the rheumatology outpatient clinic from November 2016 to June 2017.

Variables	Group A with nephritis	Grupo B without nephritis	p
	N = 27	N = 59	
Age	46 (13)	46 (9)	0.23
Gender Female	85.1%	94.9%	0.12
Time of diagnosis	7 (16)	10 (13)	0.43
Dose of prednisone	10 (10)	10 (10)	0.29

Source: Research protocol.

Table 3. Clinical manifestations in patients with SLE treated at the rheumatology outpatient clinic, according to the presence or absence of nephritis. Period from nov/2016 to jun/2017.

Variables	Group A with nephritis	Grupo B without nephritis	p
	N = 27	N = 59	
	%	%	
Cutaneous-articular	100	98.3	0.49
Pulmonary	48.1	32.2	0.15
Cardiac	11.1	18.6	0.38
Neurological	48.1	55.9	0.50

Source: Research protocol.

Table 2. Personal morbid antecedents in patients with and without lupus nephritis, attended at the outpatient clinic between nov/2016 to jun/2017.

Variables	Group A with nephritis	Grupo B without nephritis	p
	N = 27	N = 59	
	%	%	
Smoking	14.8	18.6	0.66
Hipertensão Arterial	37.0	32.2	0.66
Diabetes Mellitus	3.7	6.7	0.57
Heart Attack	7.4	6.7	0.91
Stroke	3.7	12.5	0.22
Post Menopause	39.1	39.2	0.99

Source: Research protocol.

Discussion

This study evaluated the presence of risk factors for cardiovascular disease in patients diagnosed with SLE, comparing groups with and without renal complications. A total of 86 patients were evaluated, which were divided into two groups according to the presence of lupus nephritis. 31.3% had renal disease.

No difference was found between the groups with and without nephritis regarding the time of diagnosis of SLE, which presented mean of 7 and 10 years of disease, respectively. The patients in this study have a longer time to diagnose the disease, a follow-up for years and, therefore, present a median age higher than other studies [12].

In both groups there was no correlation of age influence with a higher risk for cardiovascular disease development. Some studies, on the other hand, demonstrated that the duration of the disease is associated with the development of metabolic syndrome, determinant for cardiovascular disease. [13].

The predominant gender was female, which corresponded to 91.8% of all the patients evaluated, with no difference between the two groups. This result was already expected, since SLE occurs more frequently in the female sex, affecting mainly women of reproductive age [14].

There was no significant difference between the two groups regarding the pathological antecedents evaluated: smoking, systemic arterial hypertension, diabetes mellitus, acute myocardial infarction and stroke, however, hypertension showed a high frequency in both groups, affecting 37% and 32% in the groups with and without lupus nephritis, respectively. Hypertension, which is one of the components of the metabolic syndrome, is frequent in patients diagnosed with SLE, and this is partially justified by the use of corticosteroids and the presence of nephritis [13]. Smoking and diabetes mellitus are also frequently associated with SLE and metabolic syndrome, but these comorbidities were

less frequently present in this study (17.4 and 9.3%, respectively).

Among the women evaluated in the study, 39.2% were in menopause, possibly due to the higher median age of the patients evaluated. It is known that hypoestrogenism is a contributing factor for atherosclerosis, and that women with SLE enter menopause earlier than normal at age 45, an age that coincides with the first cardiovascular event due to the association of lupus and atherosclerosis [13].

In this study, the main systemic manifestations of SLE patients were evaluated. Most of them presented joint cutaneous involvement (98.8%), followed by neurological involvement (53.4%), pulmonary involvement (37.2%), renal (31.3%) and cardiovascular (16.2%). There was no difference between the groups with and without lupus nephritis in relation to the frequency of involvement of the other organs. Clinical manifestations among SLE patients did not present significant relevance to the development of metabolic syndrome according to and consequently to the development of cardiovascular risk. [14].

The clinical evaluation performed with the interviewees showed no difference between the two groups in relation to abdominal circumference and Body Mass Index (BMI). However, the mean abdominal circumference between the groups was 90, higher than that recommended by the World Health Organization, which recommends less than 80 for women and less than 94 for men [15].

The mean BMI assessed in SLE patients was also higher than recommended, showing that the majority of patients were overweight. High BMI is a determinant factor in the increase of cardiovascular risk for the analyzed group [8]. The estimated glomerular filtration rate (GFR) also showed no difference between the two groups, and even patients with lupus nephritis did not present a diagnosis of Chronic Renal Disease (CKD) by the criterion of reduction of creatinine clearance, which is confirmed

when persists below 60ml/min for more than 3 months [16].

It is known, however, that CKD is an independent risk factor for cardiovascular disease and, therefore, the cardiovascular risk assessed in patients in the group with lupus nephritis could not be justified exclusively by this complication. Patients interviewed included blood pressure measurement, and there was a significant difference between the groups with and without lupus nephritis, regarding the systolic blood pressure observed. In the Framingham study, which gave rise to the Framingham Cardiovascular Risk Score, used to calculate the risk for developing cardiovascular diseases, pressure levels are included among other criteria [17].

Patients with SLE and nephritis had higher systolic levels than those diagnosed with SLE and without nephritis. This finding could be related to the fact that nephritic syndrome, the main renal manifestation of lupus nephritis, is associated with elevated blood pressure levels due to failures in the renal excretion mechanism of sodium and water [18]. Indirectly, there could be a greater tendency of the group with lupus nephritis to develop cardiovascular complications.

In this study, however, there was no difference between the two groups regarding the history of acute myocardial infarction and stroke. Possibly, a longitudinal evaluation of the patients included in this analysis could be different. There is a strong association between metabolic syndrome and lupus nephritis [1]. However, it has not been clear how the link between the severity of nephritis, the intensity of immunosuppression, and the presence of metabolic syndrome exists. In the present study, a significant difference was observed regarding the presence of criteria for metabolic syndrome between the two groups, demonstrating that patients with lupus nephritis presented with a high incidence of the syndrome, which when present is associated with an increased risk for cardiovascular complications [13].

The high prevalence of cardiovascular diseases in Brazil has become a major concern when it comes to public health. It is important to track and diagnose those most susceptible, with risk factors that determine atherosclerosis and cardiovascular pathologies [17]. It was not possible to calculate the cardiovascular risk of 46 patients in the study (53.4%) since they were younger than 40 years old, a criterion that is necessary for the calculation, which is a limitation of this study. However, among patients older than 40 years ($n = 40$), the mean cardiovascular risk presented was 3.86%, 6.17% in the lupus nephritis group and 2.98% in the non-nephritis group lupus. The cardiovascular risk is considered high when above 7.5%, with both groups being therefore below the risk average [19].

Even after adjusting for altered levels in the Framingham Score criteria, some patients diagnosed with SLE continued to be at high risk for cardiovascular disease, concluding that other methods would be necessary to evaluate these patients at risk higher, such as lupus patients [2].

Conclusion

Among the cardiovascular risk factors evaluated, systemic hypertension was more frequent in SLE patients (33.7%), followed by smoking (17.4%) and diabetes mellitus (5.8%). There was, however, no difference between the frequency of these comorbidities in the groups with and without lupus nephritis. Patients with lupus nephritis had higher levels of systolic blood pressure and total cholesterol/HDL and triglyceride/HDL ratios, when compared to the group of patients with SLE without renal involvement. Clinical criteria for metabolic syndrome were present in 40.6% of the patients diagnosed with SLE, being more frequent in the group with the renal complication of the disease.

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Conflict of interest disclosures

The authors declare that there are no conflicts of interest in this study.

Contribution

Alvaro Neto: review of literature, data collect, interpretation of data, writing and 3 of the manuscript.

Ana Rachel Marinho, Anderson Azar, Caio Oliveira, Edienny Lobato, Fernanda Santos, Francisco Neto, Giordana Sousa, Igor Batista, Priscila Graim, Renan Cortinhas, Vivianne Guimarães: review of literature, data collect, interpretation of data, writing and concept of the manuscript.

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