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Sociodemographic, clinical, and laboratory profiles of patients with early- versus late-onset systemic lupus erythematosus. A single-center observational study in the Colombian Caribbean.

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Abstract

Introduction: Late-onset systemic lupus erythematosus (SLE) is a rare form of this disease characterized by atypical clinical manifestations and a high burden of comorbidities, making it challenging to diagnose and manage patients in time. The objective of this study was to compare the sociodemographic, clinical, and paraclinical characteristics, as well as the therapeutic outcomes, of patients with early- and late-onset SLE in a reference center in the Colombian Caribbean.

Methods: This was an observational, descriptive, and cross-sectional study based on a review of medical records from the RENELUP database (2010–2024). Patients aged ≥18 years who met the 2019 EULAR/ACR criteria were included. Chi-square, Fisher's, and Student's T tests were applied.

Results: A total of 282 patients were analyzed: 235 (83%) with early-stage SLE and 47 (17%) with late-stage SLE. Females predominated (89% and 81%, respectively). Patients with late-stage SLE had higher proteinuria (2,900 vs. 662 mg/24 h; P<0.001) and lower HDL levels (41 vs. 48 mg/dl; P=0.038).

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There were no significant differences in remission or mortality, although mortality was higher for late-stage disease (20.7% vs. 10.1%).

Conclusion: Patients with late SLE had a lower frequency of typical clinical manifestations, including mucocutaneous, joint, and hematological involvement. In terms of renal involvement, patients with late SLE had a higher burden of proteinuria, with no statistically significant differences in mortality or remission rate.

Keywords:

Lupus nephritis. Late Lupus. Systemic lupus erythematosus. Early Lupus. Proteinuria. Chronic kidney disease.

Systemic lupus erythematosus (SLE) is an autoimmune rheumatic disease that affects multiple systems and is characterized by the production of antibodies of unknown cause [1]. It has a higher prevalence in women of reproductive age, specifically between 15 and 44 years old, with a worldwide incidence ranging from 1 to 10 per 100,000 people annually and a prevalence of 20 to 70 per 100,000 [2]. In Colombia, the reported prevalence is 8.77 per 100,000 people, with a female-to-male ratio of 8:1 among individuals aged 45-49 years. The diagnosis of SLE is based on the classification criteria established by the European League Against Rheumatism/American College of Rheumatology (EULAR/ACR), updated in 2019 [3], which integrate clinical and immunological parameters. Among the clinical manifestations considered are constitutional symptoms such as fever, skin disorders (acute cutaneous lupus, subacute, discoid, alopecia, and/or oral ulcers), joint involvement (synovitis and/or arthritis), neuropsychiatric manifestations (delirium, psychosis, or convulsions), serositis (pleural effusion, pericardial effusion, or acute pericarditis), and hematological and renal involvement, characterized by proteinuria and the possible presence of lupus nephritis [3]. Regarding the immunological component, the detection of antiphospholipid antibodies (anticardiolipin and lupus anticoagulant), C3 and/or C4 hypocomplementemia, and positive specific antibodies is considered. This classification requires a minimum score of 10 points, with positivity for antinuclear antibodies (ANAs) being an essential criterion at titers ≥1:80 [3].

Among the main clinical features of SLE, renal involvement is closely linked to the presence of anti-dsDNA antibodies [4]. Compared to patients with discoid lesions and positive rheumatoid factor, anti-DNA-positive patients are more likely to develop lupus nephritis [5]. This condition is characterized by proteinuria of ≥500 mg/24 h, active urinary sediment, ANA positivity, and/or anti-DNA antibodies, with diagnosis confirmed by renal biopsy [6]. Renal impairment may be present at diagnosis or develop within the first years of the disease and represents a critical phase in its progression, given its strong association with increased morbidity and mortality rates [5].

Late-onset SLE, typically defined as cases appearing in patients over 50 years old, is rare, with an estimated prevalence of 2-12% worldwide [7]. In this age group, diagnosis can be difficult because clinical signs are often less specific and require careful exclusion of other potential diagnoses. In older patients, autoantibody positivity shows a characteristic pattern, with anti-Ro present in about 90% of cases, anti-La in 60%, and anti-DNA in roughly 30% [7, 8].

Patients with late-onset SLE tend to exhibit fewer of the typical symptoms seen in those younger than 50 years, especially mucocutaneous, renal, and musculoskeletal manifestations; this difference may be due to changes associated with immunological aging [7]. Overall, late-onset SLE is marked by a more gradual onset, less organ involvement, and a relatively mild clinical course [8].

The objective of this observational study was to compare the sociodemographic, clinical, and laboratory characteristics of patients diagnosed with SLE before age 50 (early-onset SLE) with those of patients diagnosed with SLE at age 50 or older (late-onset SLE). The study included patients treated at a fourth-level health center on the Colombian Caribbean Coast from 2010 to 2024, using medical records analyzed with the RENELUP tool.

Materials and methods

Study design

This is an observational, cross-sectional study. The source is retrospective.

Scenario

The study was conducted in a fourth-level health center on the Colombian Caribbean Coast. The study period was from January 1, 2010, to December 31, 2024.

Participants

The records of patients diagnosed with systemic lupus erythematosus using the EULAR/ACR 2019 classification criteria and aged 18 years or older were included in the study. There were no exclusion criteria.

Variables

The variables included demographic data, clinical data, manifestations of lupus, and biological tests, among others. The degree of remission and mortality was documented.

Data sources/measurements

The source was indirect. The data were collected through the RENELUP institutional clinical history registry system.

Bias

Observation and selection bias were avoided by applying participant selection criteria. The principal investigator always kept the data using a guide and records approved in the research protocol to avoid possible interviewer, information, and recall biases. In cases of doubt about the data's standard deviation, corrections were made through in situ reviews of anomalous data. Two researchers independently analyzed each record in duplicate, and the variables were entered into the database after verifying their agreement.

Study size

The sample was probabilistic. The population of Colombia's Caribbean region is approximately 10.7 million. With 18.9% of women aged 18 to 45 years, they represent 2,022,300 women of reproductive age. The prevalence rate of Lupus is 8.8 cases per 100,000 inhabitants. The target population with Lupus is 178 possible cases. EPI info ™ (Stat Calc, Epi Info, CDC, Atlanta. Version 7.2.6 [October 2023]), with an expected frequency of 50%, a confidence limit of 5% and a confidence level of 99.99%. The sample size was 159 cases.

Quantitative variables

The results are presented as frequencies and percentages. The scale variables were not converted to quantitative values.

Statistical analysis

The Kolmogorov–Smirnov test was used to evaluate the data distribution, with *P values* < 0.05 considered to indicate statistical significance. Quantitative variables are summarized as the mean and standard deviation (SD) or median (Mna) and interquartile range (IQR), as appropriate. Absolute and percentage relative frequencies summarize the qualitative variables. Comparisons of quantitative variables were performed using the independent-samples t-test or the median test. Comparisons of qualitative variables were performed using the chi-square test of association or Fisher's exact test. Probabilities less than 0.05 were considered statistically significant. R software was used for the analysis.

Results

Participants

A total of 282 patients were included, which met the expected sample size. A total of 235 patients had early-onset SLE, and 47 had late-onset SLE.

Main results

Table 1 shows the characteristics of the patients analyzed, categorized by age at SLE onset. The median age of the early-onset SLE group was 34 years (IQR: 29–39); the youngest patient was 18, and the oldest was 46. In the late-onset SLE group, the median age was 63 years (IQR: 59–70). The youngest patient in this group was 54 years old, and the oldest was 79.

Regarding sex distribution, 89% of patients with early-onset SLE were women, compared to 81% in the late-onset SLE group. No significant difference in sex distribution was observed between the two groups (P value = 0.135). Regarding comorbidities, arterial hypertension was the most common in both groups, while secondary Cushing syndrome was the least common. Although no statistically significant differences were found, a higher prevalence of osteoporosis was seen in patients with early-onset SLE (28% vs. 7% in late-onset SLE). Additionally, diabetes mellitus was more frequent in patients with late-onset SLE (25% vs. 9% in early-onset). The other characteristics showed no significant differences between the two groups.

Table 2 presents the means (IQRs) of the laboratory parameters analyzed in both SLE groups. Significant differences were found in the assessments of proteinuria and HDL levels. Regarding proteinuria, patients with late-onset SLE had a significantly higher median than those with early-onset SLE (662 mg/24 h vs. 2,900 mg/24 h, respectively; P < 0.001). Conversely, the median HDL concentration was significantly higher in early-onset SLE patients (48 mg/dl vs. 41 mg/dl in late-onset SLE patients; P = 0.038). No significant differences were observed in the other parameters analyzed. Regarding therapeutic response, nonremission was most common among patients with late-onset SLE, whereas partial remission was most common among those with early-onset SLE. However, these differences are not statistically significant (Table 3, p-value: 0.269).

Similarly, regarding patient follow-up, at the time of the study, 90% of patients with SLE and 80% with late-onset disease were alive, although the difference was not statistically significant (Table 4; p-value = 0.117).

Table 1. Characteristics of patients included in the study.

Characteristics	Early-onset SLE (n = 235)		Late-onset SLE (n = 47)		p value
Age (years) Mna (IQR)	34.00 (29.00–39.00)		63.00 (59.00–70.00)		---
Sex , n (%)					
Male	24	(10.53)	9	(19.15)	*0.135*
Female	204	(89.47)	38	(80.85)	
Age at diagnosis Mna (IQR)	26.00 (22.00–31.00)		55.00 (52.00–61.50)		---
Comorbidities , n (%)					
AHT	58	(73.42)	28	(100.00)	---
Diabetes mellitus	4	(8.89)	4	(25.00)	*0.189*
Dyslipidemia	6	(14.63)	4	(22.22)	*0.475*
Cushing 2nd grade	1	(2.70)	0	(0.00)	---
Osteoporosis	10	(27.78)	1	(7.14)	*0.148*
Metabolic syndrome	1	(2.86)	1	(7.69)	*0.473*
Other	24	(51.06)	6	(35.29)	*0.396*
Manifestations of SLE, n (%)					
Acute cutaneous lupus	23	(18.55)	4	(17.39)	*0.999*
Photosensitivity	70	(49.65)	11	(42.31)	*0.208*
Synovitis/arthritis	116	(73.89)	18	(69.23)	*0.636*
Hemolytic anemia	28	(22.95)	5	(20.83)	*0.999*
Leukopenia or lymphopenia	41	(36.28)	6	(28.57)	*0.621*
Thrombocytopenia	34	(30.63)	5	(22.73)	*0.610*
ANA positive	113	(85.61)	18	(94.74)	*0.471*
Anti-DNA positive	68	(64.76)	11	(57.89)	*0.609*
Anti-Sm	13	(21.67)	2	(16.67)	*0.999*
Lupus headache	33	(42.31)	10	(55.56)	*0.431*
Alopecia	40	(50.00)	8	(44.44)	*0.796*
Seizures	3	(3.70)	0	(0)	---
Psychosis	2	(2.63)	0	(0)	---
Organic brain syndrome	1	(1.32)	0	(0)	---
Visual impairment	11	(14.10)	1	(5.56)	*0.454*
Cranial nerve disorder	2	(2.63)	0	(0)	---
CVA	2	(2.67)	0	(0)	---
Vasculitis	8	(10.67)	3	(17.65)	*0.420*
Arthritis	74	(77.89)	16	(84.21)	*0.760*
Myositis	6	(7.79)	0	(0)	---
Urinary casts	8	(11.27)	0	(0)	---
Pyuria	13	(17.81)	1	(6.25)	*0.450*
Rash	25	(30.49)	6	(33.33)	*0.786*
Mucosal ulcers	15	(18.75)	1	(5.88)	*0.290*
Pleurisy	3	(4.17)	0	(0)	---
Pericarditis	4	(5.33)	0	(0)	---
Anti-dsDNA positive	35	(46.05)	9	(50.00)	*0.798*
Fever	15	(19.74)	4	(23.53)	*0.744*
Thrombocytopenia	11	(14.47)	2	(13.33)	*0.999*
Leukopenia	16	(20.78)	3	(18.75)	*0.999*
SLEDAI 2K TOTAL *Mna (IQR)*	16.00		18		*0.557*
First renal biopsy					
Histopathological activity index.	8.00 (5.00–12.00)		6.00 (4.25–8.00)		*0.133*
Histopathological chronicity index.	2.50 (2.00–4.00)		2.00 (1.00–3.00)		*0.242*

Table 2. Laboratory parameters.

Laboratory Mna (IQR)	**Early-onset lupus**		**Late Lupus**		**p value**
Proteinuria (mg/24 hs)	2.900	(1.150–5.350)	662.00	(11.00-2128.50)	*<0.001(*)*
Hematuria, *n (%)*	44	(53.66)	6	(42.86)	*0.566*
C3 consumido, n *(%)*	53	(63.09)	8	(57.14)	*0.768*
C4 consumido, *n (%)*	46	(58.97)	7	(50.00)	*0.568*
Red blood cells (millions/mm ^{3})	3.96	(3.30–4.50)	3.80	(3.20–4.05)	*0.086*
White blood cells (thousands/mm ^{3})	7.80	(5.65–10.72)	7.00	(6.30–8.28)	*0.065*
Hemoglobin (decimal value)	10.70	(9.03–12.20)	10.70	(9.28–12.05)	*0.947*
Neutrophils (thousands/mm ^{3})	8.00	(5.00–53.00)	6.00	(4.80–62.00)	*0.503*
Platelets (thousands/mm ^{3})	263.00	(170.00–341.00)	258.00	(213.75–311.00)	*0.413*
Total Cholesterol (mg/dl)	204.00	(152.50–236.25)	182.00	(141.25–210.00)	*0.382*
Triglycerides (mg/dl)	220.00	(152.00–283.00)	153.00	(131.00–274.00)	*0.635*
HDL (mg/dl)	48.10	(41.70–54.00)	41.00	(36.00–45.50)	*0.038(*)*
LDL (mg/dl)	111.20	(68.20–150.70)	115.90	(81.35–156.30)	*0.923*
Albumin (g/dl)	3.00	(2.30–3.50)	3.60	(2.50–4.30)	*0.220*
Creatinine (mg/dl)	1.00	(0.70–2.30)	1.30	(0.84–3.79)	*0.321*

(*) Significant at 5%

Table 3. Outcomes in lupus nephritis.

Degree of remission count (%)	**Early-onset lupus (n=111, n*=124)**		**Late Lupus (n=15, n*=32)**		**p value**
No remission	33	(29.73)	6	(40.00)	*0.269*
Partial remission	44	(39.64)	4	(26.67)	
Complete remission	25	(22.52)	5	(33.33)	
Relapse	9	(8.11)	0	(0.00)	

n = missing data*

Table 4. Mortality.

State, count (%)	**Early-onset lupus (n=178, n*=57)**		**Late Lupus (n=29, n*18)**		**p value**
Alive	160	(89.89)	23	(79.31)	*0.117*
Deceased	18	(10.11)	6	(20.69)	

n = missing data*

Discussion

The present study describes and compares the sociodemographic, clinical, and paraclinical features, as well as the therapeutic response and outcomes of adult patients with early-onset and late-onset SLE in a cohort from the Colombian Caribbean region. Data is provided on 235 patients with early-onset SLE and 47 with late-onset SLE; some variables yield inconclusive results.

As reported worldwide, early-onset SLE was more common in our population, with a predominance of females. In contrast, late-onset SLE, although less frequent, showed a slightly higher proportion of cases in men. This difference did not reach statistical significance but aligns with previous studies. In a Spanish registry, 3,619 patients were analyzed, of whom 15.6% were classified as having late-onset SLE and 84.4% as having early-onset SLE, with an average age at diagnosis of 57.4 years (± 10.4) and a male-to-female ratio of 5:1 [9]. In this population, the average age at diagnosis of late-onset SLE was 55 years, and a higher prevalence was observed in males than in those with early-onset SLE, consistent with the findings of the previously mentioned Spanish study [9].

Regarding clinical manifestations, the presentation varies depending on the time of disease onset. In our population, patients with early-onset SLE showed a higher frequency of skin involvement, arthritis, alopecia, and hemolytic anemia. In contrast, the late-onset

group exhibited a less specific clinical presentation, with fewer symptoms, predominantly synovitis or arthritis, and lower disease activity (SLEDAI-2 K). These findings align with previous studies that attribute these differences to immunological aging in older adults [9].

In a 2013 cohort of patients with SLE, those with late-onset disease experienced dry symptoms (xerostomia, xerophthalmia) more frequently than those with early-onset disease, as reported in other reviews. Literature from 2022 [10, 11] supports this. However, other studies indicate greater neurological and interstitial lung involvement in this group [12]. Additionally, a higher incidence of serositis was reported among patients with late-onset SLE, similar to our population, where serositis was more common in this age group. Nevertheless, the difference was not statistically significant [13].

Clinical studies, both Spanish and Latin American, report more comorbidities—especially cardiovascular—at the time of diagnosis in patients with late-onset SLE compared to those with early-onset SLE, along with a higher cumulative mortality attributable to age and comorbidities [9, 14]. In the present study, the most common comorbidity was arterial hypertension, which was more prevalent in individuals with early-onset SLE, followed by type 2 diabetes mellitus, dyslipidemia, and secondary Cushing's disease.

Regarding laboratory parameters, proteinuria was notably higher in the late-stage SLE group. These findings are striking and contrast with previous literature, which suggests less renal involvement in patients with late-stage SLE [9, 11, 14]. In the RELESSER registry, compared with the late-onset group, the early-onset SLE group had a higher frequency of renal involvement, including significant proteinuria, with an adjusted OR of 2.44 (1.91, 3.12), consistent with the clinical pattern. reported lower immunological activity and a lower incidence of lupus nephritis [9]. As in the Spanish study mentioned above, Latin American studies report that lupus nephritis and proteinuria are more frequent in patients with SLE [14].

The discrepancy in proteinuria clinical results indicating renal involvement between our study and the global literature could be due to diagnostic delay, a higher burden of comorbidities, or pathophysiological differences in renal aging, highlighting the need for closer follow-up and a more thorough evaluation of renal function in this subgroup.

Several clinical studies have compared the use of immunosuppressive medication in patients with early-onset SLE versus late-onset SLE, with immunosuppressive therapy being more common in early-onset cases, likely due to greater SLE activity or comorbidities that limit its use in late-onset SLE patients; this is reflected in a lower clinical response in the latter group [9, 11, 14]. In our study, although the specific immunosuppression treatments administered in each group were not described, the therapeutic response was assessed. In this context, most patients with early-onset SLE achieved partial remission. Conversely, in the late-onset group, lack of remission was more common, although the difference did not reach statistical significance. This may be related to therapeutic limitations in older adults, due to the coexistence of comorbidities such as diabetes mellitus and arterial hypertension, which are more prevalent in this group and influence the choice and intensity of immunosuppressants—findings consistent with reports worldwide.

Although mortality was higher in the late-onset group (20.7% vs. 10.1%), this difference was not statistically significant, likely due to the small sample size and the high rate of missing data. Nevertheless, these findings support the idea that, despite the seemingly lower clinical activity of late SLE, outcomes may be less favorable—probably because of the burden of comorbidities and reduced organ reserve in older adults. Our study highlights the importance of understanding the unique features of late-onset SLE, both in its presentation and clinical course. Larger, prospective studies with better statistical power and more representative populations are needed to confirm these findings and develop management guidelines tailored to the age at which SLE begins.

The main strengths of this study are its comparative approach, which identified differences and similarities in clinical and immunological presentation and outcomes between early-onset and late-onset SLE. It provides evidence from a Latin American population that is underrepresented in the literature. Registries expand knowledge of regional variations in the disease and improve the external validity of findings when compared with international registries. This characterization is not only academically relevant but also has direct clinical applications. It helps in recognizing different phenotypes and promotes earlier diagnosis in elderly patients, whose presentations are often atypical. Lastly, the results offer functional hypotheses for future multicenter, prospective studies aimed at better understanding the pathophysiological mechanisms behind differences between the two age groups.

The limitations of this study include its observational, descriptive design, which restricts the ability to establish causal relationships among the variables analyzed. Additionally, since it is a unique regional cohort, the results may not be fully applicable to other populations with different ethnic backgrounds or healthcare systems. The sample size in the late-onset SLE subgroup was smaller than in the early-onset SLE subgroup, potentially limiting the statistical power to detect significant differences in some clinical or paraclinical variables. Similarly, the data collected depends on the quality and completeness of clinical records, which may introduce information bias. Finally, the absence of long-term follow-up prevents a more precise assessment of the clinical progression and outcomes in both age groups.

Table 5. Main clinical studies on late SLE.

Study/Author	Population/Sample size	Average age (late onset)	Main clinical findings	Comments/Relevant differences
RELESSER (9) (España, 2017)	3.619 pacientes (565 tardío, 3.054 temprano)	≈ 57,4 ± 10,4 años	Lower frequency of lupus nephritis, greater cardiovascular comorbidity in late SLE.	Confirmed female predominance in early SLE; lower activity and higher mortality in late.
Colombian Study (15) (Colombia, 2007)	170 patients (98 tardío, 72 temprano)	≈ 61 años	Early SLE with greater cutaneous, articular and hematological compromise. Late SLE with more serositis	HLA analysis in late SLE, finding the most common allele DR17 (DR3).
Brazilian study (16) (Chagas Medeiros, et al. 2016)	414 patients (338 early onset, 60 onset in childhood, 16 late onset)	≈ 59 años	Late SLE with fewer skin and joint manifestations. Early SLE with higher rate of nephritis	Higher mortality in late SLE. No difference in treatment
Latin American study GLADEL (14) (Catoggio et al.; 2014)	1480 patients (102 late-onset, 1378 early-onset)	≈ 56 años	Late SLE with serositis and sicca symptoms. Lower prevalence of renal involvement.	Higher mortality in late SLE

Conclusion

In our cohort, patients with late SLE had a lower frequency of typical clinical manifestations, including mucocutaneous, joint, and hematologic involvement. In terms of renal involvement, patients with late SLE had a higher burden of proteinuria, with no statistically significant differences in mortality or remission rate.

Abbreviations

SLE: Systemic lupus erythematosus.
The SLEDAI is the acronym for the Systemic Lupus Erythematosus Disease Activity Index.

Supplementary information

The supplementary materials have not been provided.

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Not applicable.

Authors' contributions

GAM: Conceptualization, general supervision of the study, critical analysis of the manuscript, and final approval of the text. VPJ (Data collection and drafting of the initial draft). Editing, reviewing, and adapting the manuscript (MRS). DPR (Methodological design and analysis of results). CGM (Interpretation of clinical results, critical review of scientific content, final approval of the text). SD (Advice on theoretical and statistical aspects, discussion of the conceptual framework, final approval of the text). JPV (Initial design of the manuscript, writing of the initial draft). JPC (Initial design of the manuscript, writing of the initial draft). MPA (Data analysis and preparation of tables and figures). ACB (Validation of results and support in the final revision of the manuscript). JJS (Data collection and statistical analysis). VB (Academic supervision, advice on the scientific approach, and final revision of the manuscript). JERF (Conceptualization, discussion of the conceptual framework, and final revision of the manuscript). AI Scientific direction of the project, comprehensive review, and final approval of the manuscript.
All the authors read and approved the final version of the manuscript.

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Availability of data or materials

Not applicable.

Statements

Approval of the ethics committee and consent to participate

This study has a letter of exemption issued by the Bioethics Committee of the Colombian Society of Nephrology.

Consent for publication

Does not apply when specific images, radiographs or photographs of patients are not published.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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