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Ethnic Differences in Disease Activity among Patients with Systemic Lupus Erythematosus in a Universal Public Healthcare System

Elena Heras-Recuero [1], Antía García-Fernández [1], Patricia Quiroga-Colina [1], Cristina Gómez-Moreno [2], Arantxa Torres-Roselló [1], Raúl Fernández-Prado [3], Alejandro Avello [3], Raquel Largo [4], Ivan Ferraz-Amaro [5], Javier Llorca [6] and Miguel Ángel González-Gay [1,7,*]

[1] Division of Rheumatology, Hospital Universitario Fundación Jiménez Díaz, Madrid
[2] Fundación Jiménez Díaz School of Nursing, Autonomous University of Madrid, Spain
[3] Division of Nephrology, Hospital Universitario Fundación Jiménez Díaz, Madrid
[4] Joint and Bone Research Unit, Service of Rheumatology, IIS-Fundación Jiménez Díaz UAM, Madrid, Spain
[5] Division of Rheumatology, Hospital Universitario de Canarias, Santa Cruz de Tenerife, Spain
[6] CIBER Epidemiología y Salud Pública (CIBERESP) and Department of Medical and Surgical Sciences, University of Cantabria; Santander, Spain (currently retired)
[7] Medicine and Psychiatry Department, University of Cantabria, Santander, Spain
* Correspondence: miguelaggay@hotmail.com

Abstract

Objective: To evaluate ethnic disparities among patients with systemic lupus erythematosus (SLE) managed within a universal, publicly funded healthcare system. ***Methods:*** A retrospective study was conducted on 324 patients who met well-established criteria for SLE and were followed between 2010 and 2024 at Hospital Fundación Jiménez Díaz in Madrid, Spain. Patients of ethnically Spanish origin were classified as Caucasian, while those identified as Latin American (including individuals from South and Central America, and Brazil), Asian, or of African descent were grouped as non-Caucasian. Disease activity was assessed using the SLEDAI and SLEDAS scores, as well as the DORIS remission criteria. Comparative analyses included clinical features, disease activity, and treatment. Statistical methods included chi-square, t-test, Mann-Whitney U test, and multivariate logistic regression. ***Results:*** Of the cohort, 42.3% (n = 137) were non-Caucasian, primarily Latin American (88.3%), followed by Asian (10.2%) and individuals of African descent (1.5%). No significant differences were observed in clinical manifestations or lupus nephritis histology. However, antiphospholipid syndrome was more frequent among Caucasian patients (13.9%) compared to non-Caucasian patients (6.6%) ($p = 0.04$). In contrast, anti-Sm antibodies were more commonly detected in non-Caucasian patients (26.3% vs. 16.6%; $p = 0.03$). Non-Caucasian patients exhibited greater disease activity, with higher mean SLEDAI-2K scores (mean ± standard deviation: 1.80 ± 2.65 vs. 1.26 ± 1.84; $p = 0.03$) and SLE-DAS scores (2.06 ± 3.26 vs. 1.34 ± 1.89; $p = 0.01$), as well as significantly lower DORIS remission rates ($p = 0.03$) compared to Caucasian patients. Current prednisone use was also more frequent among non-Caucasian patients (41.3% vs. 24.7%), while the use of immunosuppressants was similar between the two groups. ***Conclusion:*** Within a universal, publicly funded healthcare system, ethnic differences did not translate into marked disparities in clinical manifestations of SLE. However, the higher disease activity and greater glucocorticoid use observed in non-Caucasian patients may reflect inherent variations in disease expression rather than inequities in care delivery.

Keywords: systemic lupus erythematosus; disease activity; public health system; Spain

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Introduction

Systemic lupus erythematosus (SLE) is a chronic, systemic autoimmune rheumatic disease of unknown origin that affects people worldwide but is more common in adults, women, and non-Caucasians. Disease severity and outcomes vary due to genetic, environmental, and social factors (1). Over recent decades, the overall prevalence of SLE has appeared to increase, with notable differences observed across geographic regions (2). SLE is often considered a model autoimmune disorder due to its clinical overlap with other autoimmune diseases and its relevance in examining disparities across ethnic and gender groups (3).

Ethnic group and sex-related variations in SLE are often linked to broader differences in socioeconomic, educational, and cultural backgrounds, frequently resulting in worse outcomes for more vulnerable populations (1,4). Non-Caucasian patients, including those of African, Latin American, and Asian descent, are frequently reported to experience more aggressive disease phenotypes and poorer prognoses (5,6).These findings have prompted the development of race-specific treatment recommendations (7,8). The disparities are often attributed not only to biological differences but also to socioeconomic inequalities, limited healthcare access, and differences in early diagnosis and treatment (9, 10). However, evidence on how these differences manifest in settings with universal, publicly funded healthcare remains limited.

Spain's comprehensive, universal healthcare system provides a unique context for evaluating health outcomes across racially diverse populations. In this study, we aimed to assess racial disparities among patients with SLE within this publicly funded system. We compared sociodemographic characteristics, clinical presentation, disease activity, severity, organ damage, and comorbidities between Caucasian (Spaniards) and non-Caucasian patients managed at a single tertiary-level referral hospital.

Materials and Methods

Study Design

Retrospective study that included 324 patients diagnosed with SLE who received care at the Rheumatology Division of Hospital Fundación Jiménez Díaz in Madrid, Spain. Clinical and demographic data were collected from patient records spanning the period from 2010 to 2024.

All patients included were over the age of 16 and met the diagnostic criteria for SLE according to at least one of the following: the 1997 revised American College of Rheumatology (ACR) classification (11), the 2012 Systemic Lupus International Collaborating Clinics (SLICC) classification (12), or the 2019 European League Against Rheumatism/ACR (EULAR/ACR) classification (13).

Population

Patients of ethnically Spanish origin were classified as Caucasian, while those identified as Latin American (including individuals from South and Central America, and Brazil), Asian, or of African descent were grouped as non-Caucasian. Ethnicity was based on self-report and regional demographic classifications commonly used in epidemiological research in Spain.

Demographic data, clinical features, treatment, laboratory results, and renal pathology were extracted from the electronic records of all SLE patients.

Information on possible histopathological differences in kidney biopsies was also assessed. In general, kidney biopsies were performed in SLE patients with persistent proteinuria (≥0.5 g/day, particularly if newly detected or increasing), nephrotic syndrome, unexplained rise in serum creatinine or reduced glomerular filtration rate, persistent active urinary sediment of unknown cause, or sudden onset of renal dysfunction with active urinary sediment suggestive of rapidly progressive glomerulonephritis. Histological classification was reported as previously described (14,15)

Disease activity was assessed using SLEDAI-2K and SLE-DAS scores from the most recent visit as recently reported (16-18). The SLICC/ACR Damage Index (SDI) (19) was used to measure irreversible organ damage.

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LLDAS (Lupus Low Disease Activity State) (20) that is a defined state of low disease activity in SLE and DORIS (21) that is a standardized definition of remission in SLE were also assessed in this series of patients.

Treatment variables included current use and dose of glucocorticoids, antimalarials use, immunosuppressive treatments and biologic agents.

The study was performed following the principles outlined in the Helsinki Declaration, and a written informed consent was obtained from all subjects before their inclusion into the project. It was approved by the Clinical Research Ethics Committee of Fundación Jiménez Díaz, Madrid (Spain) (protocol No. PIC135-23).

Statistical Analysis

Categorical variables are presented as proportions and percentages. Continuous variables are expressed as means with standard deviations (SD) or medians with interquartile ranges (IQRs), depending on whether the data were normally or non-normally distributed, respectively. Group comparisons were performed using the Mann-Whitney U test, Student's t-test, chi-squared test, or Fisher's exact test, as appropriate. Statistical significance was defined as a p-value <0.05. All analyses were conducted using SPSS 25.0 and STATA 18/SE.

Results

Demographics and Disease Characteristics

This study included 324 SLE patients, with 187 (57.7%) identified as Caucasian and 137 (42.3%) as non-Caucasian.

Main epidemiological and clinical differences between the groups are shown in **Table 1**. In this regard, Caucasian patients had longer disease duration when compared with non-Caucasian patients (18.1 years [SD 17.6] years in Caucasians versus 13.8 [SD 13.3] years in non-Caucasians; p = 0.02). Also, smoking prevalence differed significantly between the groups (p < 0.001), with a higher rate among Caucasians (18.2%) compared to non-Caucasians (3.7%).

Clinical manifestations were assessed using the 2012 SLICC classification criteria. The most common manifestations in both groups were dermatologic, musculoskeletal, and hematologic. However, the frequencies of these manifestations did not differ significantly between the groups. The only notable difference was observed in the prevalence of antiphospholipid syndrome, which was higher in Caucasians (13.9%) compared to non-Caucasians (6.6%) (p = 0.04) **(Table 1)**. In contrast, pulmonary manifestations (interstitial lung disease) appeared to be more common in non-Caucasian individuals. However, the significance of this potential difference should be considered with caution, due to the small number of reported cases in each group (1 [0.5%] in Caucasians *versus* 5 [3.7%] in non-Caucasian individuals).

Table 1. Clinical and epidemiological differences between Caucasian and non-Caucasian patients.

	Caucasian	Non-Caucasian	Totalcohort	*p value*
n, (%)	187 (57.7)	137 (42.3)	324 (100)	
Female, n (%)	166 (88.8)	124 (905)	290 (89.5)	0.61
Age at diagnosis, years, mean (SD)	35.9 (19.7)	34.2 (15.7)	35.2 (18.1)	0.39
Disease duration, years, mean (SD)	18.1 (17.6)	13.8 (13.3)	16.3 (16.1)	0.02*
Hypertension, n (%)	58 (31.0)	37 (27.0)	95 (29.3)	0.43
Diabetes, n (%)	10 (5.4)	6 (4.4)	16 (4.9)	0.69
Dyslipidemia, n (%)	51 (27.3)	25 (18.3)	76 (23.5)	0.06
Smoking, n (%)	34 (18.2)	5 (3.7)	39 (12.0)	<0.001*

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BMI, mean (SD)	24.3 (4.2)	25.0 (4.2)	24.6 (4.2)	0.13
SLE-related data				
Skin manifestations	131 (70.1)	108 (78.8)	239 (73.8)	0.08
Musculoeskeletal	121 (64.7)	97 (70.8)	218 (67.3)	0.25
Hematologic	106 (56.7)	78 (56.9)	184 (56.8)	0.96
Renal	55 (29.4)	41 (29.9)	96 (29.6)	0.92
Serositis	23 (12.3)	20 (14.6)	43 (13.3)	0.55
Pulmonary	1 (0.5)	5 (3.7)	6 (1.9)	0.04*
Cardiac	1 (0.5)	0 (0)	1 (0.3)	0.39
Neurologic	12 (6.4)	8 (5.8)	20 (6.2)	0.83
Antiphospholipid syndrome, n (%)	26 (13.9)	9 (6.6)	35 (10.8)	0.04*

*p= Differences statistically significant.

Information on histological findings from patients who underwent kidney biopsy is presented in **Table 2**.

Table 2. Histopathological differences observed in kidney biopsies of Caucasian and non-Caucasian Patients.

	Caucasian	Non-Caucasian	Totalcohort	p value
Kidney biopsy performed	44/187 (23.5)	34/137 (24.8)	78/324 (24.1)	0.79
Patients with abnormal histopatological findings				0.26+
II	0 (0.0)	1 (3.3)	1 (1.3)	
III	8 (18.6)	8 (24.3)	16 (21.1)	
IV	21 (48.8)	11 (33.3)	32 (42.1)	
V	8 (18.6)	9 (27.3)	17 (22.4)	
III-IV	1 (2.3)	0 (0.0)	1 (1.3)	
IV-V	0 (0.0)	3 (9.1)	3 (4.0)	
III-V	3 (7.0)	1 (3.0)	4 (5.3)	
Others				
IgA	1 (2.3)	0 (0.0)	1 (1.3)	
SAF	1 (2.3)	0 (0.0)	1 (1.3)	

+Global p-value for the overall distribution.

Class IV lupus nephritis (diffuse proliferative) was the most frequent subtype, particularly among Caucasian patients (48.8% *versus* 33.3% in non-Caucasians). In contrast, class V (membranous nephritis) was more common among non-Caucasians. However, no statistically significant differences in the distribution of histological classes between Caucasian and non-Caucasian patients were observed (p = 0.26) (**Table 2**).

Differences in auto-antibody profile are shown in **Table 3**. In this regard, the only statistically significant difference was in the frequency of anti-Sm antibodies that was higher in non-Caucasian than in Caucasian patients (26.3% *versus* 16.6%; p = 0.03).

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Table 3. Differences in auto-antibody profile between Caucasian and non-Caucasian SLE patients.

	Caucasian	Non-Caucasian	Totalcohort	*p value*
Anti-DNA positive, n (%)	111 (59.4)	71 (51.8)	182 (56.2)	0.18
Anti-Sm, n (%)	31 (16.6)	36 (26.3)	67 (20.7)	0.03*
Anti-ribosome P, n (%)	12 (6.4)	10 (7.3)	22 (6.8)	0.76
Anti-nucleosome, n (%)	16 (8.6)	10 (7.3)	26 (8.0)	0.68
Anti-histone, n (%)	9 (4.8)	7 (5.1)	16 (4.9)	0.90
Anti-Ro52, n (%)	45 (24.1)	36 (26.3)	81 (25.0)	0.65
Anti-Ro60, n (%)	60 (32.1)	53 (38.7)	113 (34.9)	0.22
Antiphospholipidautoantibodies, n (%)	60 (32.1)	35 (25.6)	95 (29.3)	0.20
Lupus anticoagulant, n (%)	39 (20.9)	30 (21.9)	69 (21.3)	0.82
Anticardiolipin IgM antibodies, n (%)	25 (13.4)	16 (11.7)	41 (12.7)	0.65
Anticardiolipin IgG antibodies, n (%)	26 (13.9)	19 (13.9)	45 (13.89)	0.99
Anti-β2 glycoprotein I IgM antibodies, n (%)	18 (9.6)	7 (5.1)	25 (7.7)	0.13
Anti-β2 glycoprotein I IgG antibodies, n (%)	22 (11.9)	13 (9.5)	35 (10.9)	0.49

**p*= Difference statistically significant.

Another aspect assessed in this study was whether disease activity, severity, and damage differed between Caucasian and non-Caucasian SLE patients **(Table 4)**. Regarding disease activity, when stratified into different disease activity categories using the SLEDAI-2K, Caucasian patients were more frequently found in remission or low disease activity states compared to non-Caucasian patients (p for trend = 0.08, Cochrane-Armitage test). In this regard, the mean (SD) SLEDAI-2K scores showed statistically significant differences, with lower values in Caucasians- 1.26 (1.84) *versus* 1.80 (2.65) in non-Caucasians (p = 0.03).

Table 4. Differences in disease activity, severity, and damage between Caucasian and non-Caucasian Patients.

	Caucasian	Non-Caucasian	Totalcohort	*p value*
SLEDAI-2K, mean (SD)	1.26 (1.84)	1.80 (2.65)	1.49 (2.23)	0.03*
SLEDAI-2K categories, n (%)				0.08^{+}
Remission (0)	109 (58.3)	71 (51.8)	180 (55.6)	
Low activity(1-4)	69 (36.9)	52 (38.0)	121 (37.4)	
Moderate (5-10)	8 (4.3)	12 (8.8)	20 (6.2)	
High (11-19)	1 (0.5)	2 (1.5)	3 (0.9)	
SLE-DAS	1.34 (1.89)	2.06 (3.26)	1.64 (2.58)	0.01*
SLE-DAS categories, n (%)				0.07^{+}
Remission	110 (58.8)	71 (51.8)	181 (55.9)	
Low	52 (27.8)	35 (25.6)	87 (26.9)	
Moderate	20 (10.7)	26 (19.0)	46 (14.2)	

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High	5 (2.7)	5 (3.7)	10 (3.1)	
LLDAS, n (%)	168 (89.8)	119 (86.9)	287 (88.6)	0.41
DORIS, n (%)	156 (83.4)	100 (73.0)	256 (79.0)	0.03*
PGA, n (%) Remission Low activity Moderate activity	 78 (41.7) 102 (54.6) 7 (3.7)	 49 (35.8) 80 (58.4) 8 (5.8)	 127 (39.2) 182 (56.2) 15 (4.6)	0.21+
SDI, mean (SD)	0.54 (0.95)	0.40 (0.88)	0.48 (0.92)	0.18
SDI categories , n (%) SDI= 0 SDI>= 1	 123 (65.8) 64 (34.2)	 103 (75.2) 34 (24.8)	 226 (69.8) 98 (30.2)	0.07

*p= Differences statistically significant. +p for trend (Cochrane-Armitage test).

Similar findings were observed with SLE-DAS categories, showing a trend toward a higher frequency of remission or low disease activity among Caucasian patients compared to non-Caucasians (p for trend = 0.07).

Importantly, the mean (SD) SLE-DAS scores were also significantly lower in Caucasian patients—1.34 (1.89) compared to 2.06 (3.26) in non-Caucasians (p = 0.01).

In keeping with the findings described above, the definition of remission according to DORIS criteria showed a statistically significant difference between groups (p = 0.03), with remission rates of 83.4% in the Caucasian group and 73.0% in the non-Caucasian group. No significant ethnic differences were observed in the Physician Global Assessment (PGA) distribution across remission, low, and moderate disease activity states (p = 0.21).

Regarding disease-related damage, the mean SDI was slightly higher in Caucasian patients (0.54) compared to non-Caucasians (0.40), although this difference was not statistically significant (p = 0.18).

Additional comparisons are presented in **Table 4**.

Differences in therapies used between Caucasian and non-Caucasian SLE patients are presented in **Table 5**. Non-Caucasian patients were significantly more likely to be currently using prednisone (41.6%) compared to Caucasian patients (24.6%) (p = 0.001). However, there were no significant differences between the two groups in the use of conventional therapies, including hydroxychloroquine and immunosuppressants such as methotrexate, azathioprine, mycophenolate mofetil, or cyclophosphamide. Similarly, the use of biologic therapies (rituximab or belimumab) did not differ significantly between groups **(Table 5)**.

Table 5. Differences in therapies used between Caucasian and non-Caucasian SLE patients.

	Caucasian	Non-Caucasian	Totalcohort	*p value*
Current prednisone use, n (%)	46 (24.6)	57 (41.6)	103 (31.8)	0.001*
Current prednisone dose, mg/day, mean (SD)	4.6 (2.8)	5.5 (4.6)	5.1 (3.9)	0.22
Hydroxychloroquine, n (%)	156 (83.4)	121 (88.3)	277 (85.5)	0.22
Inmunosupresants, n (%)	63 (33.7)	55 (40.1)	118 (36.4)	0.23
Biologics, n (%)	33 (17.7)	26 (19.0)	59 (18.2)	0.76

*p= Difference statistically significant.

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Discussion

SLE is a global health issue that disproportionately impacts certain ethnic groups. There is a general agreement on the fact that individuals of Asian, Black, Hispanic, and Indigenous backgrounds face higher rates of prevalence, incidence, disease severity, and mortality than in White populations (22). In this regard, Nowell *et al.* investigated ethnic disparities in the prevalence and management of rheumatic diseases within the National Patient-Centered Clinical Research Network (23). They found higher rates of conditions like SLE among Black and Hispanic patients compared to White patients. Ethnic minorities were also less likely to receive aggressive treatments or timely diagnoses. This study emphasized the need for targeted interventions and further research to address these disparities in healthcare (23).

Patel *et al.* conducted a meta-analysis of 37 studies with over 85,000 SLE patients, finding higher mortality in Black and Indigenous groups, while Hispanic and Asian patients had no significant differences in mortality compared to White individuals. However, the authors urged caution when interpreting mortality differences, citing limited generalizability, particularly to non-U.S. cohorts (24).

Other studies explored how social determinants of health impact disease severity and outcomes. In this regard, Beil *et al.* found that non-Hispanic Black and Hispanic children with juvenile-onset SLE presented with more severe disease and lived in areas with greater deprivation and reduced access to care (25). Similarly, Chang et al. noted that pediatric hospitals serving more ethnical minorities reported worse SLE outcomes and higher hospitalization rates, suggesting structural inequities (26).

A study assessed how economic insecurities, such as food, housing, healthcare, and financial stress, affected patient-reported outcomes in people with SLE (27). In a diverse cohort of 252 adults, over half reported at least one insecurity, which was linked to significantly worse physical, mental, and cognitive health outcomes. These associations persisted even after adjusting for poverty and education, indicating that economic insecurities independently impact SLE-related health. The findings highlight the importance of addressing these insecurities to improve outcomes and reduce disparities in SLE care (27).

Martz *et al.* examined the relationship between sociodemographic factors and organ damage in 438 Black/African American women with SLE living in Atlanta, GA (USA) using data from the Black Women's Experiences Living with Lupus study. The researchers found that factors such as lower income, less education, and public insurance were associated with increased organ damage over time. Their findings highlight how structural and social determinants significantly influence long-term health outcomes in Black women with SLE, highlighting the need for targeted interventions to address these disparities (28).

Williams *et al.* examined how social determinants of health, such as income, education, neighborhood, and access to care, affect SLE. They disclosed that disadvantaged populations often experience more severe disease, delayed diagnoses, and worse outcomes. Structural racism and healthcare inequities contributed significantly to these disparities (29).

Building on this context, Hernández-Cruz *et al.* studied SLE in two Hispanic subgroups in Spain: European Caucasians and Latin American Mestizos. This latter group of patients developed symptoms earlier and had more nephritis, myositis, hemolytic anemia, and higher disease severity. They also had more autoantibodies (anti-Sm, anti-Ro, anti-RNP). Despite these differences, both groups had similar mortality, damage, and co-morbidity rates. The findings highlighted potential ethnic differences in SLE presentation and severity among Hispanics (30). However, the multicenter nature of this study introduced potential variability due to differences in management across sites (30).

To address this limitation, we analyzed SLE outcomes in a single tertiary care center in Spain, comparing Caucasian and non-Caucasian patients. Non-Caucasian patients (over 40% of the cohort) had higher disease activity scores and lower remission rates per DORIS criteria. Still, no significant

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differences were found in major organ involvement, lupus nephritis classes, or the use of immunosuppressive therapies.

As supported by literature, anti-Sm antibodies were more common in non-Caucasians in our study. Yelnik*et al.* also reported higher rates of pathogenic antiphospholipid antibodies in Black and Hispanic SLE patients (31), though in our series, antiphospholipid antibodies frequency did not differ by ethnicity, but antiphospholipid syndrome was more common in Caucasians.

Regarding disease activity, we recently reported that SLEDAI-2K and SLE-DAS demonstrate strong correlation and high reproducibility in assessing disease activity in the Spanish population (18). Consistent with these findings, both SLEDAI-2K and SLE-DAS categorizations revealed that moderate to high disease activity was more frequently observed among non-Caucasian patients, whereas remission was more commonly achieved by Caucasian patients. This fact highlights a trend toward increased disease activity and lower remission rates in non-Caucasian individuals. Additionally, non-Caucasian patients in our cohort exhibited higher current glucocorticoid use, potentially reflecting their more active disease state.

On the other hand, it is plausible that the higher (though not statistically significant) SDI values observed in Caucasian Spaniards when compared with non-Caucasians may be partially explained by their significantly longer disease duration, as SDI reflects cumulative organ damage over time.

The absence of strong clinical differences between Caucasian and non-Caucasian patients in our population are in contrast to studies from countries with less equitable healthcare systems, where minority populations often face delays in diagnosis and treatment, leading to poorer outcomes. Therefore, the universal access offered by the Spanish public healthcare system may help explain the absence of major disparities in clinical outcomes, ensuring equitable care and consistent access to medications regardless of ethnic background. However, the differences observed, particularly in disease activity, remission rates, and current glucocorticoid use, may reflect intrinsic disease variation or subtle differences in treatment response. Since access to care and disease management strategies were comparable between Caucasian and non-Caucasian patients at our center, these variations could also stem from underlying genetic differences. These findings warrant further investigation in larger, more diverse, and longitudinal studies.

In conclusion, although non-Caucasian patients followed at a single tertiary hospital in Spain exhibited higher disease activity and higher current glucocorticoid use, these differences were modest. These results highlight the potential of equitable, universal healthcare systems to reduce ethnic disparities in autoimmune diseases such as SLE.

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References

1. Pons-Estel GJ, Ugarte-Gil MF, Alarcón GS. Epidemiology of systemic lupus erythematosus. *Expert Rev Clin Immunol* 2017;13(8):799–814. doi:10.1080/1744666X.2017.1327352.
2. Borchers AT, Naguwa SM, Shoenfeld Y, *et al.* The geoepidemiology of systemic lupus erythematosus. *Autoimmun Rev* 2010;9:A277–87.
3. Tsokos GC. Systemic lupus erythematosus. *N Engl J Med* 2011;365:2110–21.
4. Barber MRW, Falasinnu T, Ramsey-goldman R, CLARKE AE. The global epidemiology of SLE: narrowing the knowledge gaps. *Rheumatology (Oxford)* 2023;62(Suppl 1):i4–9. doi:10.1093/rheumatology/keac610.
5. Tian J, Zhang D, Yao X, Huang Y, Lu Q. Global epidemiology of systemic lupus erythematosus: a comprehensive systematic analysis and modelling study. *Ann Rheum Dis* 2023;82:351–6. doi:10.1136/ard-2022-223035.

 doi:10.20944/preprints202507.1812.v1

6. Demas KL, Costenbader KH. Disparities in lupus care and outcomes. *Curr OpinRheumatol* 2009;21:102–9.
7. Isenberg D, Appel GB, Contreras G, *et al.* Influence of race/ethnicity on response to lupus nephritis treatment: the ALMS study. *Rheumatology (Oxford)* 2010;49:128–40.
8. Vina ER, Utset TO, Hannon MJ, *et al*. Racial differences in treatment preferences among lupus patients: a two-site study. *Clin Exp Rheumatol* 2014;32:680–8.
9. Pons-Estel G, Alarcón G. Lupus in Hispanics: a matter of serious concern. *Cleve Clin J Med* 2012;79:824–34.
10. Carter EE, Barr SG, Clarke AE. The global burden of SLE: prevalence, health disparities and socioeconomic impact. *Nat Rev Rheumatol* 2016;12:605–20. doi:10.1038/nrrheum.2016.137.
11. Hochberg MC. Updating the American College of Rheumatology revised criteria for the classification of systemic lupus erythematosus. *Arthritis Rheum* 1997;40:1725.
12. Petri M, Orbai AM, Alarcón GS, *et al*. Derivation and validation of the systemic lupus international collaborating clinics classification criteria for systemic lupus erythematosus. *Arthritis Rheum* 2012;64:2677–86.
13. Aringer M, Costenbader K, Daikh D, *et al*. European League Against Rheumatism/American College of Rheumatology classification criteria for systemic lupus erythematosus. *Ann Rheum Dis* 2019;78:1151–9.
14. Weening JJ, D'agati VD, Schwartz MM, *et al.* The classification of glomerulonephritis in systemic lupus erythematosus revisited. *Kidney Int* 2004;65(2):521–30. doi:10.1111/j.1523-1755.2004.00443.x.
15. Bajema IM, Wilhelmus S, Alpers CE, *et al*. Revision of the International Society of Nephrology/Renal Pathology Society classification for lupus nephritis: clarification of definitions, and modified National Institutes of Health activity and chronicity indices. *Kidney Int* 2018;93(4):789–96. doi:10.1016/j.kint.2017.11.023.
16. Gladman DD, Ibañez D, Urowitz MB. Systemic lupus erythematosus disease activity index 2000. *J Rheumatol* 2002;29:288–91.
17. Jesus D, Matos A, Henriques C, *et al*. Derivation and validation of the SLE disease activity score (SLE-DAS): a new SLE continuous measure with high sensitivity for changes in disease activity. *Ann Rheum Dis* 2019;78:365–71.
18. Heras-Recuero E, García-Fernández A, Blázquez-Sánchez T, *et al*. Strong correlation between SLEDAI and SLE-DAS in the Spanish population: assessment of discordant patients. *Semin Arthritis Rheum* 2025;73:152758. doi:10.1016/j.semarthrit.2025.152758.
19. Romero-Diaz J, Isenberg D, Ramsey-Goldman R. Measures of adult systemic lupus erythematosus: updated version of British Isles Lupus Assessment Group (BILAG 2004), European Consensus Lupus Activity Measurements (ECLAM), Systemic Lupus Activity Measure, Revised (SLAM-R), Systemic Lupus Activity Questionnaire for population studies (SLAQ), Systemic Lupus Erythematosus Disease Activity Index 2000 (SLEDAI-2K), and Systemic Lupus International Collaborating Clinics/American College of Rheumatology Damage Index (SDI). *Arthritis Care Res* (Hoboken) 2011;63 Suppl 11:S37–46.
20. Franklyn K, Lau CS, Navarra SV, *et al.* Definition and initial validation of a Lupus Low Disease Activity State (LLDAS). *Ann Rheum Dis* 2016;75:1615–21.
21. Van Vollenhoven RF, Bertsias G, Doria A, *et al*. 2021 DORIS definition of remission in SLE: final recommendations from an international task force. *Lupus Sci Med* 2021;8:e000538.
22. Barber MRW, Falasinnu T, Ramsey-Goldman R, Clarke AE. The global epidemiology of SLE: narrowing the knowledge gaps. *Rheumatology (Oxford)* 2023;62(Suppl 1):i4–9. doi:10.1093/rheumatology/keac610.
23. Nowell WB, Barnes EL, Venkatachalam S, *et al*. Racial and ethnic distribution of rheumatic diseases in health systems of the National Patient-Centered Clinical Research Network. *J Rheumatol* 2023;50(11):1503–8. doi:10.3899/jrheum.2022-1300.
24. Patel S, Yang Z, Nagra D, *et al*. Association of race and ethnicity with mortality in adults with SLE: a systematic literature review and meta-analysis. *Lupus Sci Med* 2025;12(1):e001383. doi:10.1136/lupus-2024-001383.
25. Beil EF, DeGuzman M, Ramires A, *et al*. The impact of social inequities on presentation of juvenile-onset systemic lupus erythematosus at a large tertiary center. *J Clin Rheumatol* 2025 Mar 19. doi:10.1097/RHU.0000000000002228.

 doi:10.20944/preprints202507.1812.v1

26. Chang JC, Liu JP, Berbert LM, *et al.* Racial and ethnic composition of populations served by freestanding children's hospitals and disparities in outcomes of pediatric lupus. *Arthritis Care Res* (Hoboken) 2024;76(7):926–35. doi:10.1002/acr.25314.
27. Sandoval-Heglund D, Roberts E, Park J, *et al*. Economic insecurities and patient-reported outcomes in patients with systemic lupus erythematosus in the USA: a cross-sectional analysis of data from the California Lupus Epidemiology Study. *Lancet Rheumatol* 2024;6(2):e105–14. doi:10.1016/S2665-9913(23)00296-5.
28. Martz CD, Webb-Detiege T, Danila MI, Chae DH. Sociodemographic profiles and organ damage accrual in the Black Women's Experience Living with Lupus study. *Lupus* 2024;33(1):17–25. doi:10.1177/09612033231218923.
29. Williams JN, Drenkard C, Lim SS. The impact of social determinants of health on the presentation, management and outcomes of systemic lupus erythematosus. *Rheumatology (Oxford)* 2023;62(Suppl 1):i10–4. doi:10.1093/rheumatology/keac613.
30. Hernández Cruz B, Alonso F, Calvo ALÉN J, *et al*. Differences in clinical manifestations and increased severity of systemic lupus erythematosus between two groups of Hispanics: European Caucasians versus Latin American mestizos (data from the RELESSER registry). *Lupus* 2020;29(1):27–36. doi:10.1177/0961203319889667.
31. Yelnik CM, Xie X, Guerra MM, *et al*. Prevalence of clinically meaningful antiphospholipid antibodies in patients with systemic lupus erythematosus varies by race and ethnicity. *Ann Rheum Dis* 2024;83(3):404–6. doi:10.1136/ard-2023-224952.