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Clinical and laboratory profiles of systemic lupus erythematosus patients in a new rheumatology clinic in southwestern Nigeria

Gbenga Joshua Odunlami[1], Adeola Ajibade[2], Bolanle Aderonke Omotoso[3], Muzamil Olamide Hassan[3], Adeyemi Abiola Adefidipe[1], Fatai Olatunde Olanrewaju[3], Ademola Olusegun Enitan[1], Tajudin Adesegun Adetunji[1], Olumide Akinniyi Akinyele[1], Oluyomi Okunola[1]

[1]Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria
[2]Somerset NHS Foundation Trust, Taunton, United Kingdom
[3]Obafemi Awolowo University, Ile-Ife, Nigeria

Abstract

Introduction: The aims were to study the sociodemographic characteristics of patients presenting to the clinic and to study the clinical and serological pattern of systemic lupus erythematosus (SLE) in a new rheumatology clinic of a predominantly Yoruba population.

Material and methods: This was a retrospective, cross-sectional study conducted over 7 years (January 2017 – December 2023). Patients who satisfied the 1997 American College of Rheumatology (ACR) and/or the 2012 Systemic Lupus International Collaborating Clinics (SLICC) classification criteria were enrolled using their medical records. Patients with overlap syndromes and other inflammatory or noninflammatory rheumatic diseases were excluded from the study. Their sociodemographic, clinical, laboratory, and treatment data were retrieved from their medical records and analysed using IBM SPSS version 23.0 software.

Results: A total of 65 patients were diagnosed with SLE with a frequency of 15.8%. The mean age ±SD of the patients at presentation was 33.85 years ±11.01 and the female to male ratio was 9.8 : 1. The median (IQR) duration of symptoms at presentation was 7.0 months (3–24). The common clinical presentations included synovitis (86.2%), acute cutaneous rash (53.8%), oral ulcers (52.3%), nonscarring alopecia (50.8%), and serositis (47.7%). Proteinuria was seen in 37.7% of the patients and the predominant renal histopathological feature was Class IV. Antinuclear antibody was 100% positive with 50.94% of the patients having a titre of 1 : 5,120 and above. Anti-double-stranded deoxyribonucleic acid and anti-Smith antibodies each had 50% prevalence. Dyslipidaemia was found in 76.7% of the patients.

Conclusions: The study's findings are largely consistent with similar studies done in Africa. Further prospective multi-centred studies are needed to further determine the epidemiological characteristics of the disease in Nigeria with a multi-ethnic population.

Key words: systemic lupus erythematosus, clinical and laboratory profile, rheumatology clinic, southwestern Nigeria.

Introduction

Systemic lupus erythematosus (SLE) is a multi-systemic autoimmune disorder of connective tissue that is characterized by the production of autoantibodies against the nuclear and cytoplasmic antigens, diverse manifestations ranging from mild to severe, remissions and flares, and varied prognosis. It is more prevalent among African Americans, American Indians, Alaskans, and Arabians. It predominantly affects women with a reported female-to-male ratio (F : M) of 7-15 : 1. The peak incidence of SLE in women is between the third and fifth decade [1, 2]. A systematic review of the worldwide epidemiology of SLE by Rees et al. [3] suggested that North America had the highest incidence and prevalence of 23.2/100,000 person-years and 241/100,000 people

Address for correspondence:
Gbenga Joshua Odunlami, Obafemi Awolowo University Teaching Hospitals Complex, PMB 5538, Ile-Ife, Osun, Postal code 220212, Nigeria, e-mail: godunlami@yahoo.com
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respectively while the lowest incidence was recorded in Africa at 0.3/100,000 person-years and lowest prevalence in Northern Australia (0 in a sample of 847 people). People of African descent had the highest incidence and prevalence while Caucasians had the lowest incidence and prevalence of the disease. The global burden of SLE cannot be overemphasized as the mortality from the disease is 2–3 times higher than the general population and it runs a more aggressive course among Africans and Hispanics. It is also one of the leading causes of death in young women and the causes of mortality in SLE include cardiovascular disease (CVD), infection, and renal disease [4–6]. Systemic lupus erythematosus was previously reported to be rare in sub-Saharan Africa compared to the African-American counterparts and this was attributed to immune disruption by parasitic infections [7]. However, there has been increasing reporting of this disease from this region over time, suggesting otherwise [8, 9]. Although most of these studies are hospital-based, a recent meta-analysis of these studies from sub-Saharan Africa showed an SLE prevalence of 1.7% among 28,575 participants. Rheumatological, dermatological, and haematological manifestations were the most common clinical presentations while patients showed a high seroprevalence for extractable nuclear antigens (ENA) such as anti-Smith (anti-Sm), anti-ribonucleoprotein, anti-Ro, and anti-La [8]. A recent multicentred, descriptive, retrospective, hospital-based study by Osaze et al. was done where records of patients with SLE seen within 4 years (2017–2020) in 20 rheumatology centres in Nigeria were studied to determine the pattern of SLE manifestations in Nigeria. A total of 913 patients were seen during the period but 17 patients were excluded due to incomplete data. The mean age of presentation was 34.47 years with an F : M ratio of 8.1 : 1. Synovitis was the most common symptom, accounting for 61% of cases, followed by acute, subacute, and chronic cutaneous lupus accounting for 51%, 19.9%, and 11.4% of cases respectively. Antinuclear antibody (ANA) was positive in 98% of cases, with titres ranging from 1 : 80 to 1 : 64,000 [10]. It is important to note that this study heralded the Lupus Registry in Nigeria (LURIN) established in 2021 where all data on lupus diagnosed in Nigeria are continuously collated and is one of the very few SLE registries in Africa. This retrospective study gave an overview of the pattern of SLE among patients of multiple ethnicities from different geopolitical locations which may show some variations from the clinical and laboratory pattern of the disease in this study location. Also interesting in this study was the fact that the two major tribes in Nigeria, the Igbos and the Yorubas, share the majority of the patients with SLE. This opens a research opportunity as to whether the pattern of SLE manifestations in these tribes differs from the general picture. Two other similar studies have been done in Nigeria. Adelowo et al. [11] reported the pattern of SLE in a private clinic in Lagos, a metropolitan city with people of multiple ethnicities. Emorinken et al. [12] studied the pattern of SLE manifestations in a rural tertiary centre in Irrua, south-south Nigeria. Irrua is dominated by the Esan tribe. However, this study was carried out in an ancient suburban city of Ile-Ife, southwest Nigeria, predominantly occupied by the Yorubas. Therefore, this study aimed to provide more specific details about the pattern of SLE in this fairly homogeneous Yoruba population.

Material and methods

Study design

This was a retrospective cross-sectional study conducted over 7 years from January 2017 to December 2023. This study was carried out at the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) rheumatology outpatient clinic, Ile-Ife, Osun state. Ile-Ife is an ancient Yoruba city located in Osun state, southwestern Nigeria, about 218 km northeast of Lagos, the commercial city of Nigeria. The hospital is a tertiary health centre that serves the populace in the surrounding towns and states.

Inclusion and exclusion criteria

All patients who satisfied the revised 1997 American College of Rheumatology (ACR) and/or the 2012 Systemic Lupus International Collaborating Clinics (SLICC) Classification Criteria for SLE were recruited for the study to assess the baseline clinical and laboratory characteristics of their disease. Patients with SLE overlapping with other diseases, and other inflammatory and non-inflammatory rheumatic diseases were excluded from the study.

Study procedure

The medical records of all the patients that met the classification criteria were identified. Data from the medical records were collated using a proforma to obtain their sociodemographic and clinical information, laboratory parameters (haemogram, renal function tests, fasting lipid profile, erythrocyte sedimentation rate [ESR], C-reactive protein [CRP], urine analysis and microscopy), electrocardiographic (ECG) and/or echocardiographic (ECHO) findings, and serological profile such as ANA, anti-double stranded deoxyribonucleic acid antibody (anti-dsDNA), anti-Sm, anti-phospholipid antibodies, and direct Coombs tests. Results of renal biop-

sies done for patients were inputted using the International Society of Nephrology and Renal Pathology Society (ISN/RPS) 2003 Classification. The laboratory investigations that were carried out in the tertiary health centre of the study conformed to the international standard techniques and were reported by seasoned pathologists in our laboratories. The serological tests that were not available in our study centre were done and reported in a certified private laboratory by experienced pathologists. The ECG and ECHO findings were reported by cardiologists in the study centre. Data about their treatment history were also retrieved. Their disease activity was measured using the Mexican version of the SLE disease activity index (MEX-SLEDAI).

Statistical analysis

Data were analysed using IBM SPSS version 23.0 version software (IBM Corp., Chicago, IL, USA). The normality of the continuous variables was assessed using the Kolmogorov-Smirnov test. Continuous variables with normal and skewed distribution were presented as mean standard deviation (SD) and median (interquartile range), respectively. Categorical variables were presented as frequencies and percentages. Spearman's rho correlation analysis was used to determine the correlation between two quantitative variables with skewed distribution.

Bioethical standards

Ethical approval was obtained from the National Health Research Ethics Committee of Nigeria (NHREC) as the study centre was used as a part of the multi-centre hospital-based study of the pattern of SLE in Nigeria. The NHREC Approval Number was NHREC/01/01/2007–26/01/2022.

Results

Sociodemographic characteristics

A total of 65 patients were diagnosed with SLE, accounting for 15.8% of the 412 rheumatological cases seen during the study period. The mean age ±SD of the patients was 33.85 ±11.01 with an age range of 16–65 years. Patients in the age range 20–29 were mostly affected, comprising 33.8%, followed by the 30–39 age group, accounting for 29.2%. Fifty-nine (90.8%) were female while 6 (9.2%) were male, with a F : M of 9.8 to 1. The median (IQR) duration of symptoms at presentation was 7 months (3–24). About 58.5% were married while 40% were single. Business/trading accounted for the highest proportion (33.8%), followed by students (21.5%). The majority of the patients had tertiary education (83.1%). The details of the sociodemographic characteristics are shown in Table I.

Clinical characteristics of patients with systemic lupus erythematosus

About 86.2% of the patients presented with synovitis while 50.8% of the patients presented with nonscarring

Table I. Sociodemographic profile of patients with SLE

Variables	Frequency (%)
Sex	
Male	6 (9.2)
Female	59 (90.8)
Age range (years)	
10–19	4 (6.2)
20–29	22 (33.8)
30–39	19 (29.2)
40–49	13 (20.0)
50–59	6 (9.2)
60 and above	1 (1.5)
Mean age ±SD in years	33.85 ±11.01
Duration of illness (median [IQR]) (months)	7 (3-24)
Marital status	
Single	26 (40)
Married	38 (58.5)
Widowed	1 (1.5)
Ethnic group	
Igbo	4 (6.2)
Yoruba	58 (89.2)
Others	3 (4.6)
Occupation	
Unemployed	2 (3.1)
Civil servant	13 (20)
Private	8 (12.3)
Business/trading	22 (33.8)
Student	14 (21.5)
Others	6 (9.2)
Monthly income (USD)	
< 25	27 (41.5)
25–83.3	28 (43.1)
> 83.3–208.3	7 (10.8)
> 208.3	3 (4.6)
Mean BMI ±SD	23.76 ±5.55

BMI – body mass index, USD – US dollars; using 1,200 naira = 1 USD.

Table II. Clinical manifestations of SLE in the study population

Variables	Frequency (%)
Acute cutaneous rash	35 (53.8)
Lupus malar rash	21 (32.3)
Bullous rash	3 (4.6)
Maculopapular rash	18 (27.7)
Photosensitive rash	10 (15.4)
Subacute cutaneous rash	18 (27.7)
Psoriasiform/annular rash	2 (3.1)
Post-inflammatory rash	16 (24.6)
Chronic cutaneous rash	13 (20)
Classic discord	11 (16.9)
Hypertrophic lupus	2 (3.1)
Mucosal lupus	1 (1.5)
Ulcers	
Oral	34 (52.3)
Palatal	11 (16.9)
Buccal	28 (43.1)
Nasal	21 (32.3)
Genital ulcer	1 (1.5)
Nonscarring alopecia	33 (50.8)
Synovitis	56 (86.2)
Serositis	31 (47.7)
Typical pleurisy	14 (21.5)
Pleural effusion	16 (24.6)
Clinical pericarditis	6 (9.2)
Pericardial effusion by ECHO	12 (18.5)
Ascites	1 (1.5)
Neurologic symptoms	22 (33.8)
Seizure	4 (6.2)
Psychosis	3 (4.6)
Mononeuritis	1 (1.5)
Myelitis	2 (3.1)
Peripheral neuropathy	6 (9.2)
Acute confusional state	3 (4.6)
Headache	5 (7.7)
Migrainous	3 (4.6)
Non-migrainous	2 (3.1)
Memory loss	9 (13.8)
Loss of concentration	5 (7.7)
Inattentiveness	2 (3.1)

ECHO – echocardiography.

alopecia. About 53.8%, 27.7%, and 20% of the patients presented with acute, subacute, and chronic cutaneous manifestations of SLE respectively. Malar, post-inflammatory, and classic discoid rash were the most common acute, subacute, and chronic cutaneous manifestations, accounting for 32.3%, 24.6%, and 16.9% of the patients respectively. Oral ulcers were present in about 52.3%. Nasal ulcers were reported in 32.3% of the patients. Serositis was present in 47.7% of the patients, with pleural effusion being the commonest manifestation (24.6%). Pericardial effusion by ECHO was detected in 18.5% of the patients. Neurologic symptoms were reported by 33.8% of the patients, with memory loss accounting for the commonest neurologic presentation (13.8%). The summary of the pattern of clinical manifestations is shown in Table II.

Laboratory features

The mean haematocrit (Hct) SD for the patients was 31.16% (5.04) with 56.9% of the patients having Hct of < 33% (anaemia). Leukopenia (< 4,000/mm^3) and lymphopenia (< 1,000/mm^3) were present in 24.6% and 12.3% respectively while thrombocytopenia (< 100,000/mm^3) was present in about 9.2% of the patients. The median [IQR] ESR of all the patients was 103 mm/h IQR (63.5–129.5). There was a statistically significant negative correlation between ESR and packed cell volume (PCV) (r = –0.489, p < 0.05). However, there was no statistically significant correlation between ESR and CRP or MEX-SLEDAI. There was a positive correlation between ESR and MEX-SLEDAI but it was not statistically significant (r = 0.146, p > 0.05). Proteinuria was the most common urinary abnormality, seen in 37.5% of the patients while high serum creatinine was detected in 19.4%. Renal biopsy was done in 13 (20%) of the patients and the predominant histopathological class was diffuse proliferative lupus nephritis (46.1%), followed by membranous lupus nephritis (30.77%). Dyslipidaemia was found in 76.7% of the patients.

Regarding serology, ANA was done in 62 of the patients and they were all positive (100%). Positive ANA titres ranged from 1 : 80 to > 1 : 5,120, with the latter accounting for the majority (50.94%). Speckled appearance was the predominant immunofluorescence staining pattern, seen in 40/46 (86.96%). Anti-dsDNA and anti-Sm were each seen in 50% of those tested. The MEX-SLEDAI score was used to assess disease activity. About 47.9% of them had a score of > 5, signifying active disease. Other details are shown in Table III.

Summary of prescribed medications

Glucocorticosteroids (GCs) and hydroxychloroquine (HCQ) were the most frequently prescribed medications (98.5% and 93.8% respectively). Intravenous cyclo-

Table III. Laboratory, serological, and renal histopathological pattern of systemic lupus erythematosus (SLE) in the study population

Variables	Number tested/Category	Frequency (%), value
Hct (%), Mean ±SD	65	31.16 ±5.04
WBC [per ml], Median (IQR)	65	5,900 (4,000–8,250)
Lymphocyte [per ml], Median (IQR)	65	2,100 (1,259–3,092)
ESR [mm/h], Median (IQR)	60	103 (63.5–129.5)
Creatinine [mmol/l], Median (IQR)	62	90 (71.75–110.00)
Anaemia (PCV < 33%)	65	37 (56.9)
Haemolytic anaemia	65	3 (4.6)
Leukopenia (< 4,000/mm^3)	65	16 (24.6)
Lymphopenia (< 1,000/mm^3)	65	8 (12.3)
Thrombocytopenia (< 100,000/mm^3)	65	6 (9.2)
High ESR (> 20 mm/h)	60	55 (91.7)
High CRP (> 7.4 mg/l)	22	15 (68.2)
Elevated serum creatinine (> 132 µmol/l)	62	12 (19.4)
Urinalysis		
Protein (3+ or > 0.5 g/24 h or PCR > 0.5)	40	15 (37.5)
Sub-nephrotic range proteinuria (< 3 g/24 h)	40	10 (66.7)
Nephrotic range proteinuria (> 3 g/24 h)	40	5 (33.3)
Blood	65	1 (1.5)
Pyuria	65	2 (3.1)
Blood and pyuria	65	1 (1.5)
Red cell cast	65	1 (1.5)
White cell cast	65	2 (3.1)
Dyslipidaemia	43	33 (76.7)
Serology		
ANA positivity	62	62 (100)
ANA titre	1 : 80	2/53 (3.77)
	1 : 160	3/53 (5.66)
	1 : 320	10/53 (18.87)
	1 : 640	2/53 (3.77)
	1 : 1,280	3/53 (5.66)
	1 : 2,560	6/53 (11.32)
	1 : 5,120 and above	27/53 (50.94)
ANA pattern		
	Speckled	40/46 (86.96)
	Homogeneous	6/46 (13.04)
Anti-dsDNA positivity	54	27 (50)
Anti-Sm	34	17 (50)
Antiphospholipid antibody	5	1 (20)
Renal biopsy	Yes	13 (20)
	Class I	0 (0)
	Class II	3/13 (23.08)
	Class III	0 (0)
	Class IV	6/13 (46.15)
	Class V	4/13 (30.77)
	Class VI	1/13 (7.69)
	Class IV + V	1/13 (7.69)
MEX-SLEDAI	48	
< 2		31.3
2–5		20.8
> 5		47.9
Median (IQR) MEX-SLEDAI		5 (0–12.5)

ANA – antinuclear antibody, anti-dsDNA – anti-double stranded deoxyribonucleic acid antibody, anti-Sm – antibody against the Smith antigen, CRP – C-reactive protein, ESR – erythrocyte sedimentation rate, Hct – haematocrit, MEX-SLEDAI – Mexican version of systemic lupus erythematosus disease activity index, WBC – white blood cell count.

Table IV. Pattern of medication prescribed in the study population

Medications	Number of patients (%)
Glucocortcosteroids	64 (98.5)
Hydroxychloroquine	61 (93.8)
Azathioprine	10 (15.4)
Mycophenolate mofetil	11 (16.9)
Cyclophosphamide	4 (6.2)

phosphamide and oral mycophenolate mofetil were less commonly prescribed medications used in treating more severe lupus. The pattern of medications is shown in Table IV.

Discussion

This study analysed 65 patients who were diagnosed with SLE since the inception of a rheumatology clinic in Ile-Ife, Nigeria 7 years ago. Ile-Ife is an ancient city predominantly populated by the Yoruba race, as reflected in this study, where they constituted about 89.2% of the patients. Most of the patients were females in their second to fourth decades of life. The median (IQR) MEX-SLEDAI score of the patients was 5.0 (0–12.5), while the highest proportion of the patients (47.9%) presented with a MEX-SLEDAI score of > 5, all suggesting active disease on presentation. A raised ESR and positive ANA were common, found in 91.7% and 100% of the study population. Glucocorticosteroids and HCQ were the anchor medications for the treatment of the disease.

The frequency of SLE among rheumatic diseases seen in the clinic during the study period was 15.8%. This was higher than the frequency of SLE in other similar studies by Adelowo et al. [11] and Emorinken et al. [12], where it was 5.28% and 4.7% respectively. This may be due to the increasing awareness of the disease among healthcare professionals in recent times and their prompt referral to rheumatologists. This further highlights the fact that SLE is much more common than was earlier reported and negates Deborah Simmons's prevalent gradient theory, which tried to explain the rarity in Africa based on the endemicity of malaria infections [9, 13].

Our study also showed the predominant female pattern of involvement (9.8 : 1), similar to other studies done among Africans, African-Americans, Europeans, and Arabians, ranging between 7.9 : 1 and 32.5 : 1 [10–12, 14–20]. The mean duration of symptoms at presentation is similar to studies done in south-south Nigeria and Saudi Arabia but lower than in the multi-centred hospital-based study in Nigeria [10, 12, 17]. However, a Polish study showed a much longer duration of symptoms (5 years), which may be due to a milder, nonspecific initial course of the disease in the study population [20]. The mean age at presentation in this study was 33.8 years, similar to other studies [10, 11, 17], and most of them were engaged in productive activities. However, Emorinken et al. from south-south Nigeria reported a lower mean age at presentation of 28 years [12]. The sociodemographic pattern of our study also showed that 84.6% of the patients earned less than 83 dollars per month, suggesting that SLE disproportionately affects the disadvantaged population [21].

Arthritis was the most common clinical presentation, found in 82.6% of the patients. This is similar to other studies where arthritis was also the most common clinical feature [10–12, 16, 19]. This finding is also supported by a systematic review and meta-analysis of SLE in sub-Saharan Africa which showed that rheumatological manifestations were the most common features, ranging from 5.1% to 99.9%. Similarly, arthritis was the most common clinical manifestation across Polish, African-American, and Brazilian studies [19, 20, 22]. Cutaneous manifestations are common features in SLE. In our study, acute cutaneous rash was the most common cutaneous feature (53.8%), and the highest proportion of these patients presented with malar rash (32.3%). This is similar to other studies done in Nigeria but a considerably higher frequency of malar rash was found in studies involving largely homogeneous African American and South African populations. The same pattern was also observed for discoid rash in these studies as well [10, 12, 18, 19]. Interestingly, about 15.4% had photosensitivity rash, which is much lower than in other Nigerian studies [10, 12] but similar to what Adelowo et al. reported [11]. Bortolini et al. reported a much higher frequency of malar and photosensitivity rash among a Brazilian study population (53.5% and 72.5% respectively), which may be due to the interplay between the genetic and environmental factors (e.g., sunlight) [22]. A Polish study also reported a higher frequency of photosensitivity rash of 37% [20]. Nonetheless, photosensitivity rash and cutaneous lupus have been linked to photosensitivity [23].

Alopecia was a common presentation in our study (50.8%), similar to other Nigerian studies [10–12] but higher than in a Polish study (29.6%) [20]. Oral ulcers were recorded in 52.3% of the patients, which is similar to other African, African-American, Brazilian, and Arabian studies but it was lower in Polish and Moroccan studies [16, 17, 19, 20, 22, 24]. Serositis is another common presentation in this series, seen in 47.7%, similar to what was reported by Emorinken et al. and Kamen et al. (40.4% and 45.1% respectively) [12, 19], but much lower rates were found in studies involving Sudanese and South African populations (16.1% and 18.1% respec-

tively) [15, 18] as well as in Polish and Brazilian studies (22.5% and 20.3% respectively) [20, 22].

Neuropsychiatric manifestation was an important feature, reported in 33.8% of the patients, with a similar finding reported by Osaze et al. and also an Ivorian study by Gbané-Koné et al. (33.8% and 36.75% respectively) [10, 25], but much lower rates were recorded in a comparative study of SLE between Sudanese and Swedish populations (15.6% and 11% respectively) [26]. Our finding was also higher than in African-American and Brazilian studies (15.7% and 12.1% respectively) but lower than in a Polish study (59.2%) [20, 22, 27]. Moreover, memory loss was the most common neurologic symptom reported in our cohorts (13.8%), but a similar multi-centre study in Nigeria and a Polish study reported headache as their most common neurologic symptom [10, 20]. In a meta-analysis of studies on neuropsychiatric symptoms, headache (28.3%) and cognitive dysfunction (19.7%) were the most frequently reported neurologic symptoms [28].

Renal involvement (proteinuria) was detected in about 37.5% in our study, similar to other studies done in Nigeria, US, Brazil, and Abidjan [10, 12, 19, 22, 25], but it was higher in a Malaysian study (58.6%) [29]. This may be due to the multi-ethnicity of the Malaysian population. Moreover, a Polish study reported a lower frequency of proteinuria (22.5%) [20]. Renal biopsy was done in 13 patients and the predominant histopathological pattern was Class IV (46.15%), similar to other studies done in Nigeria, Brazil, Poland, and Egypt [10, 22, 30, 31]. However, a South African study reported Class V while a Sudanese study reported Class III as their predominant renal pathologic features [15, 32].

Anaemia, leukopenia, and lymphopenia were the common haematological features in our study, similar to a study from south-south Nigeria and a meta-analysis of studies on SLE from sub-Saharan Africa [8, 12] as well as other studies outside Africa [20, 22]. Erythrocyte sedimentation rate was the commonest laboratory feature, found in 91% of the patients, with a median value of 103 mm/h. This highlights the sensitivity of ESR to make the diagnosis, especially in low-resource settings where the cost of serological investigations is unaffordable to many patients and the clinical probability of SLE is high. Moreover, ESR has been suggested as a more reliable biomarker of disease activity than anti-dsDNA and complement fractions, and this may help in the diagnosis of an active disease [33]. In this study, it is noteworthy that the median ESR is high. However, it is not unexpected as it is a marker of active disease which most of our patients presented with, and also corroborates the average MEX-SLEDAI score of the study population indicating an active disease. However, anaemia, infection, and hypoalbuminaemia could also have contributed to this raised ESR. Many of our patients presented with anaemia, another marker of disease activity, and unsurprisingly, there was a statistically significant negative correlation between ESR and anaemia in our patients. Some of our patients presented with infections, especially those with severe lupus. Infections may be a feature of SLE or a complication of its treatment. Hypoalbuminaemia occurred in our patients with lupus nephritis and nephrotic range proteinuria. Although many of our patients earned below $83 per month, it does not necessarily mean they are malnourished. Our legal tender in Nigeria is the naira, which has a much lower value than the US dollar, and therefore implies a lower cost of living in Nigeria. Moreover, the majority of our patients are well educated with a culturally inclined formidable family and social support.

Antinuclear antibody was the most common feature (100%) in this study, which corroborates other studies where their detection rate was > 90% [10, 17, 19, 25]. In a meta-analysis of studies of SLE in sub-Saharan Africa, the prevalence of ANA was statistically determined to be 89.7% [8]. This underlies the crucial importance of ANA in making the diagnosis of SLE. In our study, about 50.94% had ANA titres of 1 : 5,120 and above, higher than in a multi-centred study in Nigeria (15.7%) and a study from south-south Nigeria (17.3%) [10, 12]. This suggests that southwestern Nigerian patients, especially those of the Yoruba tribe, may have higher ANA titres than patients from other tribes and geopolitical zones in the country. This may have a diagnostic implication as a retrospective study of 1,297 patients with ANA results including 148 patients with SLE showed that higher ANA titres are highly suggestive and specific for SLE [34]. This may obviate the need for SLE-specific antinuclear autoantibody tests, which are becoming increasingly unaffordable to our patients, thereby relieving the costs of managing SLE in poorly insured low-income countries. Another important finding in this study is the predominant speckled immunofluorescence pattern (86.96%), which corroborates other studies done in Nigeria [10, 12, 35]. This may be attributable to the presence of antibodies against anti-ENA such as anti-Sm, which are common in black patients [35, 36], giving a speckled immunofluorescence pattern. In our study, anti-Sm was detected in 50% of the patients, while similar or higher rates were found in studies from Nigeria, Ivory Coast, Morocco, and the US [12, 19, 24, 25] and studies from Sudan and Brazil reported a lower rate of 19.3% and 26.4%, respectively [15, 22]. A meta-analysis of sub-Saharan African studies on SLE by Essouma et al. [8] estimated a similar pooled prevalence of anti-Sm at 53.5%. Furthermore, Essouma et al. [8] also estimated a pooled anti-dsDNA prevalence at 54.6%, similar to what was detected in this study (50%).

Table V. Clinical and laboratory profile of SLE in cross-sectional studies across ethnicities and races

Parameter	Authors, reference, country, year										
	Alarcon et al. [27], USA, 2002	Wadee et al. [18], South Africa, 2007	Kamen et al. [19], USA, 2008	Adelowo et al. [11], Nigeria, 2009	Genga et al. [16], Kenya, 2015	Ahmed et al. [15], Sudan, 2017	Tomczyk et al. [20], Poland, 2018	Bortolini et al. [22], Brazil, 2021	Emorinken et al. [12], Nigeria, 2021	Osaze et al. [10], Nigeria, 2023	Our study, 2023
Number of patients	216	226	184	66	100	62	71	537	52	896	65
Mean age	38.1	34	39.0	33	36.6	31.0	31.5	31	28	34.5	33.8
Duration of disease	9 months	–	7.9 years	2.6 years	3.0 years	–	5 years	–	4.0 months	18 months	7 months
F : M	11 : 1	18 : 1	10.5 : 1	21 : 1	32.5 : 1	14.5 : 1	7.9 : 1	12 : 1	9.4 : 1	8.1 : 1	9.8 : 1
Clinical features (%)											
Arthritis	88.5	70.4	89.1	87	90	85.5	71.8	77.9	86.5	61.6	86.2
Malar rash	44.7	58.4	56.0	21.7	54	43.5	–	53.5	25	34.5	32.3
Discoid rash	32.7	41.5	32.4	43.9	22	27.4	–	14.9	11.5	19.9	16.9
Photosensitivity rash	46.1	38.9	60.9	9	44	30.6	37	72.5	48.1	41.5	15.4
Alopecia	–	–	–	45	–	32.3	29.6	–	44.2	45	50.8
Oral ulcers	45.6	38.5	43.5	33	36	30.6	22.5	44	42.3	47.7	52.3
Serositis	59.5	18.1	45.1	13.8	25.8	16.1	22.5	20.3	40.4	32.6	47.7
Neuropsychiatric	15.7	15.9	21.2	15.8	50	35.5	59.2	12.1	25	33.8	33.8
Renal features	54.4	43.8	55.4	41.2	50	66.1	22.5	41.6	38.5	30.1	37.5
Serology [%]											
ANA	97.2	99.1	98.9	99.7	98.5	–	87	–	100	98	100
Anti-dsDNA	–	55.3	33.0	80.1	53.5	48.4	47.9	60.5	69.2	59.9	50
Anti-Sm	–	40.7	18.5	41.6	63.5	19.3	–	26.4	48.1	37.6	50

ANA – antinuclear antibody, anti-dsDNA – anti-double stranded deoxyribonucleic acid antibody, anti-Sm – antibody against the Smith antigen, F – female, M – male.

Serological analysis in our study was restricted to ANA, anti-dsDNA, and anti-Sm because the extractable nuclear antibody (ENA) panel is very expensive as patients pay out of their pockets for these tests. The clinical and laboratory profile of SLE in cross-sectional studies across ethnicities and races is shown in Table V.

A number of co-morbidities have been associated with SLE, one of which is dyslipidaemia. Dyslipidaemia is one of the determinants of CVD, a predictor of mortality in SLE. Premature CVD is 50 times more common in premenopausal women with SLE within the 35–44-year age group than in the general population [37]. The prevalence of dyslipidaemia in SLE in studies ranged from 30% to 60% and the pathogenetic mechanisms implicated include antibodies against lipoprotein lipase and cytokines regulating the balance between pro-atherogenic and anti-atherogenic lipoproteins [38]. In our study, dyslipidaemia was found in 76% of cohorts. Therefore, traditional risk factors for CVD should be screened in every patient with SLE.

Glucocorticosteroids and HCQ are the anchor medications in SLE. Glucocorticosteroids are widely available and cheap. However, since the COVID-19 pandemic, there has been an astronomic rise in the price of HCQ due to its increased demand for the treatment of COVID-19 infections despite studies against its efficacy [39]. Even after the pandemic, its price has remained high with limited availability. Although HCQ is an antimalarial, the World Health Organization recommends artemisinin-based combination therapy, which we use to treat malaria in Nigeria. Therefore, all our patients in this study were commenced on oral HCQ in our clinic after the diagnosis of SLE was made by a rheumatologist. The use of biologics in Nigeria is largely limited to private rheumatology clinic settings where patients' care is funded by large multinational companies and agencies [40]. Therefore, cheaper conventional immunosuppressants such as mycophenolate mofetil, cyclophosphamide, and azathioprine are preferred for treating more severe lupus. However, the costs of these medications have escalated in recent times, making them increasingly unaffordable as maintenance regimens and GC-sparing agents. This has resulted in poor drug compliance and the seeking of cheaper alternative medicine since patients pay out of their pockets. Consequently, some of these patients present with flares and complications, sometimes leading to mortality. Although this study is not aimed at assessing the accessibility to treatment and factors affecting drug compliance, further studies on these areas will help health policymakers in developing countries to understand the socioeconomic burden of this disease and allocate resources to relieve the cost of managing SLE. This will improve their prognosis, quality of life, and productivity.

Limitations

This study has some limitations. First, it had a small sample size and not all the patients were properly investigated. Second, it was a retrospective study, which precluded us from determining their disease course, treatment outcome and prognosis. Third, this is a single-centre study and thus the generalisability of these findings may be limited. Therefore, a prospective multicentred study would be more appropriate to determine the epidemiology of lupus. This can be achieved with the establishment of LURIN, where data of patients with SLE on initial and follow-up visits in Nigeria are being collated electronically for research purposes. Fourth, most of our patients could not afford to do extensive serological investigations, which could have been helpful to carry out proper serological profiling.

Conclusions

Patients with SLE in this study population are mainly from the Yoruba tribe, predominantly females in their second to fourth decades of life. Arthritis, mucocutaneous manifestations, raised ESR, and positive ANA were the most frequent clinical, laboratory, and serological features, respectively. Dyslipidaemia was a common comorbidity among the cohorts.

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