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LUPUS AROUND THE WORLD

Clinical and immunological pattern and outcome of Egyptian systemic lupus erythematosus patients: a single center experience

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Objective: The objective of this study was to describe the clinical and immunological pattern and disease outcome in Egyptian systemic lupus erythematosus patients. **Patients and methods:** The medical records of 770 systemic lupus erythematosus patients who were followed from 2002–2015 at Kasr Alainy Hospital, Cairo University, were retrospectively reviewed. **Results:** There were 707 (91.8%) females. The mean age at disease onset was 22.1 ± 8.6 and the disease duration was 6.1 ± 4.5 years. The main clinical manifestations were mucocutaneous (90.8% with oral ulcers affecting 52.5%), arthritis (80.3%), nephritis (67.8%), hematologic involvement (64.9%), serositis (55.2%) and neuropsychiatric manifestations (44.3%). The frequencies of antinuclear antibodies were 94.3%, anti-dsDNA 74.8%, anti-Smith 11%, anticardiolipin antibodies 29.5% and lupus anticoagulant 19.8%. Infections, predominantly bacterial, affected 337 (43.8%) patients. Thirty-three (4.3%) patients died. The main causes of death were sepsis and disease activity. The five- and 10-year survival rates for the total cohort were 97.4% and 96.3%, respectively, and were 96% and 92%, respectively for those with nephritis ($p = 0.008$). Autoimmune hemolytic anemia, thrombocytopenia, elevated serum creatinine, a higher damage index, infections, a higher glucocorticoid dose and cyclophosphamide use $\geq$ six months were associated with an increased risk of mortality with odds ratios of 3.69, $p < 0.01$; 4.12, $p < 0.001$; 1.54, $p < 0.001$; 1.43, $p < 0.001$; 5.08, $p < 0.001$; 5.04, $p < 0.001$ and 2.25, $p = 0.03$, respectively. **Conclusion:** Compared to other cohorts, a relatively lower mean age at systemic lupus erythematosus onset and higher frequencies of oral ulcers, serositis and nephritis were found. *Lupus* (2018) **27,** 1562–1569.

Key words: Systemic lupus erythematosus; Egypt; clinical manifestations; outcome; predictors of mortality

Introduction

Systemic lupus erythematosus (SLE) is an autoimmune multi-system disorder characterized by a chronic inflammatory process secondary to the presence of a variety autoantibodies, the most prominent being antinuclear antibodies (ANA). This inflammation and secondary damage can afflict almost any tissue in the body, but has a predilection for the skin, mucous membranes, kidneys, serous membranes and nervous system, among others.[1] Genetic and environmental factors influence disease expression, disease activity, damage accrual and consequently quality of life and survival.[2] Ethnicity has been shown to influence the prevalence and severity of the various clinical and laboratory manifestations of SLE.[3–5] Ethnicity is a broader concept than race as it includes the common characteristics of a certain population such as geographic location, cultural and socio-economic factors.[2] Studies describing the characteristics of Egyptian SLE patients are scarce.[6,7] The aim of this present study is to describe the clinical and immunological pattern and long-term outcome of Egyptian SLE patients and to compare their disease characteristics with other studies from different countries around the world.

Patients and methods

The medical records of 770 patients diagnosed with SLE, fulfilling the 2012 Systemic Lupus International Collaborating Clinics (SLICC) classification criteria

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of SLE[8] who have been admitted to, or came for follow up visits at, the Department of Rheumatology and Rehabilitation, Kasr Alainy Hospital of Cairo University during the period between January 2002 and April 2015 were retrospectively reviewed. Drug induced lupus was excluded.

The following data were collected by review of the patients' medical records: age at disease onset (defined at the time of onset of symptoms attributed to SLE), the duration of the disease (defined as the time from disease onset until the date of last follow up or the time of death), the clinical features of SLE, routine laboratory parameters and autoimmune profile markers for which each patient had been tested. Routine laboratory tests included a complete blood count, serum aminotransferases, serum albumin, fasting and postprandial blood sugar, serum urea and creatinine, serum albumin, complete urine analysis and 24-hour urinary proteins. The hematologic manifestations recorded included hemolytic anemia, leucopenia (a total leucocytic count $<4000/mm^3$), thrombocytopenia (a platelet count $<100{,}000/mm^3$) and lymphopenia (a lymphocyte count $<1000/mm^3$). Renal impairment was defined as a persistent elevation of serum creatinine above the laboratory reference range (≥ 1.2 mg/dl). End-stage renal disease was defined as renal disease requiring chronic renal dialysis or renal transplantation. Autoantibodies that were recorded included antinuclear, anti-double stranded DNA, anti-Smith, lupus anticoagulant, anticardiolipin IgG and IgM, anti-β2-glycoprotein-1 IgG and IgM antibodies. The disease manifestations were recorded at the disease onset and during the course of the disease. Patients who had their disease onset before 18 years of age were classified as juvenile-onset SLE.[9] SLE patients fulfilling the Revised Sapporo Classification Criteria for antiphospholipid syndrome (APS) were classified as secondary APS.[10] The Systemic Lupus Erythematosus Disease Activity Index 2000 (SLEDAI 2K)[11] was calculated for all patients at the time of disease onset, and the SLICC/American College of Rheumatology-Damage Index (SLICC/ACR-DI)[12] was calculated for all patients at the time of their last visit or at the last assessment before death for deceased patients. Episodes of infection throughout the course of the disease were analyzed according to the site and causative organism. The cause of death was recorded whenever possible.

The protocol of the study was approved by the local Ethics Committee and conforms to the guidelines of the Declaration of Helsinki.

Statistical methods

All statistical calculations were done using the computer program Statistical Package for the Social Science (SPSS); SPSS Inc., Chicago, USA, release 15 for Microsoft Windows (2006). Data were expressed as frequency, range, median or mean ± standard deviation (SD) where appropriate. Univariate logistic regression analysis was used to test for the preferential effect of several variables on mortality. Survival analysis was done, comparing that of patients with renal disease to those without, using Kaplan–Maier statistics; p values less than 0.05 were considered statistically significant.

Results

Demographic characteristics

Out of the total number of patients, 707 (91.8%) were females with a female to male ratio of 11:1. The mean age of the patients included in this study at disease onset was 22.1 ± 8.6 years (range 2–52 years). Juvenile-onset SLE was documented in 242 (31.4%) patients. The mean disease duration was found to be 6.1 ± 4.7 years (range two months to 30 years).

Clinical features

The most common presenting features of SLE occurring at the onset of the disease in our cohort were arthritis, occurring in 480 (62.3%) patients, mucocutaneous manifestations in 383 (49.7%) and fever in 302 (39.2%). Arthralgia was the presenting feature in 238 (30.9%) patients while serositis occurred at the onset in 164 (21.3%) cases. Renal involvement and hematologic affection were equally present at the onset in 138 (17.9%) patients. The mean SLEDAI score at disease onset was 8.8 ± 8.2 points while the mean SLICC/ACR-DI score at the time of last visit/time of death was found to be 1.7 ± 1.8 points. The most important clinical and laboratory features in our cohort over the course of the disease are summarized in Table 1.

Of the 522 patients with renal involvement, 511(97.9%) patients exhibited proteinuria, of whom 98 had values in the nephrotic range (>3.5 g/24 h), while 413 patients had sub-nephrotic range proteinuria. Sterile pyuria was documented in 357/522 (68.4%), hematuria in 340 (65.1%) and casts in 307 (58.8%) patients. One patient had developed renal vein thrombosis. Renal

Table 1 Clinical manifestations and autoantibodies in systemic lupus erythematosus patients.

	N = *770*	*%*
Mucocutaneous involvement	699	90.8
Malar rash	449	58.3
Discoid lupus	58	7.5
Photosensitivity	268	34.8
Oral ulcers	404	52.5
SCLE	51	6.6
Arthritis	618	80.3
Myositis	42	5.5
Serositis	154	55.2
Pleuritis	375	48.7
Pericarditis	143	18.6
Nephritis	522	67.8
Neuropsychiatric manifestations	341	44.3
Seizures	102	13.3
Psychosis	103	13.4
Lupus headache	186	24.2
Cognitive impairment	58	7.5
Peripheral neuropathies	58	7.5
Cerebrovascular accidents	26	3.4
Transient ischemic attacks	24	3.1
Cranial neuropathies	17	2.2
Acute confusional state	13	1.7
Cerebellar affection	9	1.2
Chorea	6	0.8
Hematological involvement	538	64.9
Hemolytic anemia	145	18.8
Leukopenia	264	34.3
Thrombocytopenia	145	21.8
Lymphopenia	312	40.5
Diabetes mellitus	205	26.6

		Positive (from those tested)	
Autoantibodies	*No. of tested patients*	No.	%
ANA	770	726	94.3
Anti-ds-DNA	670	501	74.8
Anti-Sm	471	52	11.0
aCL IgG	543	135	24.9
aCL IgM	545	127	23.3
LA	494	98	19.8
Anti β2-GP-1 IgG	40	15	37.5
Anti β2-GP-1 IgM	45	16	35.6

ANA: anti-nuclear antibodies; anti-ds-DNA: anti-double stranded DNA antibodies; anti β2-GP-1: anti-β2 glycoprotein-1 antibodies; aCL: anticardiolipin antibodies; anti-Sm: anti-Smith antibodies; Ig: immunoglobulin; LA: lupus anticoagulant; SCLE: subacute cutaneous lupus erythematosus.

biopsy results were available for 345/522 patients. The remaining patients either had not undergone a biopsy procedure due to patient refusal or a medical contraindication, or had undergone a biopsy procedure that had failed to obtain an adequate tissue core for microscopic examination. Class III lupus nephritis (LN) was the most frequent, appearing in 121/345 biopsies (35.07%), followed by class IV in 104 (30.15%). Class II was documented in 54 (15.65%) cases, class V in 35 (10.14%), class III–V in 23 (6.67%) and class VI in eight (2.32%) biopsies. Regarding the renal function, the mean serum creatinine among the 770 studied patients was 1.15 ± 1.32 mg/dl; 541 (70.3%) had within normal serum creatinine, 206 (26.8%) exhibited impairment of renal function and 23 (3%) patients had end-stage renal disease.

Autoantibody profile

Table 1 summarizes the frequencies of patients with positive immunological tests. A total of 572 patients were tested for one or more of the five antiphospholipid antibodies (lupus anticoagulant, anticardiolipin IgG and IgM, anti-β_2-glycoprotein-1 IgG and IgM), of whom 217 (37.9%) patients were positive for one or more antibodies. Among the 217 patients who had one or more antiphospholipid antibodies, 74 (34.1%) fulfilled the clinical criteria of APS.

Medications

Oral glucocorticoids (GC) were utilized by all of the studied patients and, according to the maximum dose of daily oral prednisone ever given, they were classified into three categories: 152 (20.65%) patients received an oral GC dose <15 mg/d, 389 (49.2%) received a dose ≥ 15 mg/d but <40 mg/d, while the remaining 229 (30.1%) received doses ≥ 40 mg/d. Intravenous methylprednisolone pulses were administered to 482 (62.6%) patients. Antimalarials were used by 659 (85.9%), azathioprine by 567 (73.6%) and mycophenolate mophetil by 80 (14.9%) of the patients. Intravenous cyclophosphamide pulses were given to 340 (44.2%) and biologic therapy (rituximab) to only two (0.3%) patients. Concerning anticoagulant therapy, 64 (8.3%) patients received warfarin (18 of those received low dose aspirin in addition), 19 (2.5%) received enoxaparin Na and low dose aspirin during pregnancy for obstetric indications and 44 (5.7%) patients received low dose aspirin alone.

Infections

During the entire course of their disease, 337 (43.8%) patients had developed at least one episode of infection. Infectious episodes were categorized according to the causative organism into bacterial in 281 (83.4%), fungal in 96 (28.5%), viral in 33 (3.8%) and parasitic in 20 (5.9%) cases. Infectious episodes due to bacterial pathogens most frequently involved the chest ($n = 155$; 46%) and the urinary

Table 2 Characteristics of deceased patients ($n = 33$).

Female/male	29/4
Mean age at death	34 ± 10.8 years
Mean disease duration	5.36 ± 4.7 years
Causes of death	
Disease activity	Neuropsychiatric systemic lupus erythematosus (3)
	Rapidly progressive glomerulonephritis (3)
	Heart failure (1)
	Acute pulmonary embolism (1)
	Alveolar hemorrhage (2)
Infections	Septic shock (13)
Other causes	Acute leukemia (1)
	Advanced pulmonary hypertension and right sided heart failure (1)
	Unknown (8)
Mean SLEDAI at disease onset	9.88 ± 8.23
Mean SLICC/ACR-DI at time of death	3.33 ± 1.80

SLEDAI: Systemic Lupus Erythematosus Disease Activity Index; SLICC/ACR-DI: Systemic Lupus International Collaborating Clinics/American College of Rheumatology-Damage Index.

Table 3 Univariate analysis for possible predictors of mortality.

Variable	p-*value*	*Odds ratio*	*95% Confidence interval*
Disease duration (y)	0.33	0.96	0.88–1.04
Male sex	0.40	1.56	0.54–4.66
SLEDAI at disease onset	0.49	1.02	0.98–1.06
SLICC/ACR-DI at last visit	<0.001[a]	1.43	1.23–1.65
Neuropsychiatric SLE	0.26	1.52	0.74–3.15
Seizures	0.85	0.9	0.31–2.61
Serositis	0.32	1.44	0.67–2.98
Autoimmune hemolytic anemia	0.01[a]	3.69	1.34–10.16
Thrombocytopenia	<0.001[a]	4.12	2.04–8.35
Leucopenia	0.50	1.14	0.78–1.68
Elevated serum creatinine	<0.001[a]	1.54	1.32–1.8
Greater GC dose	<0.001[a]	5.04	2.52–10.09
Infections	<0.001[a]	5.08	2.18–11.87
CYC use $\geq$ six months	0.03[a]	2.25	1.1–4.63
Diabetes mellitus	0.38	1.4	0.67–2.94
Secondary APS	0.75	0.81	0.25–2.75
Juvenile onset SLE	0.2	0.58	0.25–1.34

APS: antiphospholipid syndrome; CYC: cyclophosphamide; GC: glucocorticoids; SLE: systemic lupus erythematosus; SLEDAI: Systemic Lupus Erythematosus Disease Activity Index; SLICC/ACR-DI: Systemic Lupus International Collaborating Clinics/American College of Rheumatology Damage Index; y: years.
[a]Statistically significant.

tract ($n = 99$; 29.4%) followed by skin and soft tissues ($n = 58$; 17.8%). Tuberculosis occurred in five (1.5%) cases.

Mortality and survival

By the time of study termination, 555 (72.1%) patients were still followed at our center, 182 (23.6%) were lost to follow up and 33 (4.3%) had died. The characteristics of the deceased patients are shown in Table 2. Septic shock was the most common cause of mortality, followed by active disease.

Univariate logistic regression analysis was used to test for the preferential effect of different variable(s) on mortality, as illustrated in Table 3; elevated serum creatinine ≥ 1.2 mg/dl, autoimmune hemolytic anemia, thrombocytopenia, history of cyclophosphamide use $\geq$six months, a higher glucocorticoid dose administered, higher SLICC/ACR-DI and history of episode(s) of infection were risk factors for shorter survival.

Regarding the overall survival of the total cohort, the five-year survival was 97.4%, the 10-year survival was 96.3%. Patients with renal involvement had significantly lower overall survival rates than those without ($p = 0.008$). The five-year survival of patients with renal involvement was found to be 96% and the 10-year survival was found to be 92%. In contrast, the five-year survival of patients without renal involvement was 99.6%, the 10-year survival was 99.1% (Figure 1).

Discussion

The present study characterized the demographic, clinical and laboratory manifestations and outcome of 770 Egyptian SLE patients recruited from Kasr Alainy Hospital of Cairo University, the largest tertiary referral center in Egypt. Comparisons between our cohort and other previous studies from countries of the Middle East and North Africa[13–19] and other countries worldwide[20–26] regarding the cumulative disease manifestations are presented in Tables 4 and 5.

The mean age at disease onset in the studied patients (22.1 ± 8.6 years) is somewhat lower than in other studies[13,14,19,20,22,23] Indeed, juvenile-onset SLE was documented in 31.4%, which is higher than in studies from Saudi Arabia (19.1%),[13] Korea (14.4 %)[27] and Brazil (14.5%).[28] The most common features reported at the onset of the disease in this study were articular, mucocutaneous manifestations and fever, which have also been reported by other investigators.[19,20,22]

Compared to other studies,[13–26] our patients showed a higher frequency of oral ulcers (52.5%), serositis (55.2%) and LN (67.8%). The WHO renal histological classes III and IV together accounted

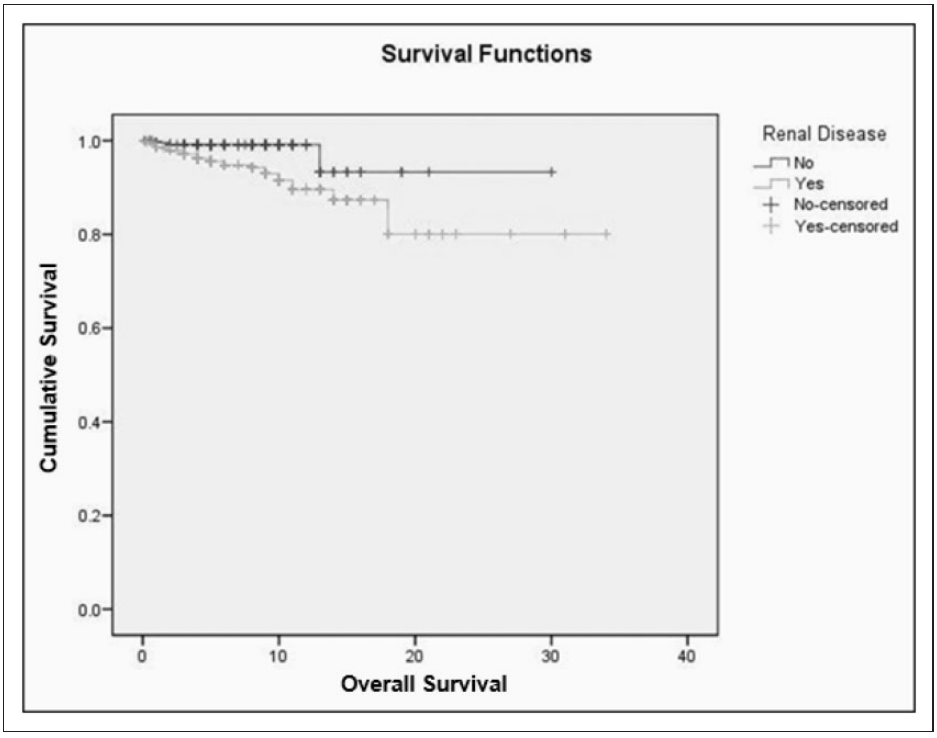

Figure 1 Kaplan–Meier survival curve in relation to presence/absence of renal disease. OAS: overall survival.

for 65.2% of histologically confirmed cases of LN while they accounted for 47%, 55.4% and 72.9% of biopsy proven LN in studies from Saudi Arabia,[29] Tunisia[19] and Morocco,[30] respectively.

There has been discordance between different studies concerning the definition of neurological involvement in lupus, thus making comparisons difficult. Seizures and psychosis were the most frequently reported neurological manifestations as these defined neurological involvement in the older classification criteria for SLE.[31] These were found in 26.6% of the present cohort, which is nearly similar to other studies[13,20,24,25] but higher than in studies from the United Arab Emirates, Kuwait and China.[14,15,26]

Among the studied SLE patients, the frequencies of autoantibodies were comparable to other studies (Tables 4 and 5), although the Tunisian study[19] reported a much higher prevalence of lupus anticoagulant of 64.5%.

The mortality rate of 4.3% found in our study is similar to that reported in Turkey[17] and Saudi Arabia,[13] yet less than that described in the Euro-Lupus cohort (6.8%),[32] Tunisia (7.5%)[19] and the Latin American cohort (11.8%).[22] The mean age at death of our patients was 32.98 ± 10.9 years, comparable to reports from Saudi Arabia,[13] Tunisia[19] and Latin America[22] but lower than in the Euro-Lupus cohort (44 ± 15 years).[32] In the present study, the most common causes of mortality were sepsis and active disease, confirming previous reports;[13,19,33] in other studies, thromboses,[32] ischemic heart disease and chronic renal failure[17] were also important causes of mortality.

Regarding the overall survival of the total cohort of SLE patients, the five- and 10-year survival rates were 97.4% and 96.3%, respectively. Other cohorts reported a five-year survival rate ranging from 85.3–98%,[13,17,19,20,33] while 10-year survival rates ranged from 81.9–97%.[13,17,19,32]

LN was associated with significantly lower survival rates; the five- and 10-year survival rates were 96% and 92%, respectively. The survival among LN patients in Saudi Arabia was 96% at five years and 95% at ten years.[29] In the Euro-Lupus cohort, a five-year survival rate of 92% was found in those who had nephritis at their initial presentation[34] and the 10-year survival was 88%.[32]

In the present study, impairment of renal function, including end-stage renal disease, was identified as a predictor of mortality, in agreement with other investigators.[17,33] Hemolytic anemia and thrombocytopenia were identified as predictors of mortality, confirming previous reports.[17,35] We also found that the occurrence of infections was associated with an increased risk of mortality, which has also been reported previously.[36] Higher corticosteroid doses and cyclophosphamide use for more

Table 4 Comparison of the studied systemic lupus erythematosus patients to other countries from the Middle East and North Africa.

Parameter	*Our series*	*Saudi Arabia*[13]	*UAE*[14]	*Kuwait*[15]	*Lebanon*[16]	*Turkey*[17]	*Iran*[18]	*Tunisia*[19]
No. of patients	770	624	110	108	100	428	410	749
Mean age at onset (O)/diagnosis (D)	22.1	25.3 (O)	28.9 (O)	31.5 (D)[a]	25 (D)[a]	40.3 (D)	30.3(D)	30.7 (O)
±standard deviation	8.6	11.4	—	—	—	12.4	—	13.3
Female : male	11:1	9.8:1	20.5:1	10:1	6.1:1	13.8:1	6.6:1	9.2:1
Malar rash	58.3	47.9	62	43	52	—	60.5	68.7
Discoid lupus	7.5	17.6	12.8	10	19	17	49	11.9
Photosensitivity	34.8	30.6	45	48	16	70.1	54.5	67.6
Oral ulcers	52.5	39.1	23.9	33	40	38.8	28	23.3
Arthritis	80.3	80.4	86.2	87	95	76.9	65.5	55.9
Serositis	55.2	27.4	16.5	29	40	15.4	38	—
Pleuritis	48.7	15.8	—	—	—	—	26	23
Pericarditis	18.6	20.7	—	—	—	—	12	26.7
Nephritis	67.8	47.9	46.8	37	50	32.9	47.8	49.5
Neuropsychiatric	44.3	27.6	15.6	23	19	12.9	31.5	37
Seizures	13.3	—	10.1	4.4	19	—	18.5	8.4
Psychosis	13.4	—	6.4	0	7	—	13	17.3
Hematological	64.9	82.7	60.5	53	47	67.3	78	81
Hemolytic anemia	18.8	—	7.3	—	10	6.5	12.4	73.4
Leukopenia	34.3	30.1	51	83	17	—	64.5	—
Thrombocytopenia	21.8	10.9	17.4	26	33	18	44.5	21.4
Lymphopenia	40.5	40.3	—	—	—	—	43	61.9
ANA	94.3	99.7	98.2	94	87	98.1	93	98
Anti-dsDNA	74.8	80.1	85.3	58	50	38.3	83	77.3
Anti-Sm	11.0	41.6	18.3	13	—	11	—	44.8
aCL	29.5	—	—	—	—	—	26	63.7
aCL IgG	24.9	49.7	16.5	—	—	—	—	—
aCL IgM	23.3	33.5	22	—	—	—	—	—
LA	19.8	27	16.5	—	—	4.7	—	64.5

ANAL antinuclear antibody; anti-dsDNA: anti-double stranded DNA; anti-Sm: anti-Smith; aCL: anticardiolipin; LA: lupus anticoagulant; UAE: United Arab Emirates.
[a]Age is presented as median.

than six months were also found to predict mortality, in agreement with other investigators.[33,17] Disease activity at disease onset was not a predictor of mortality in the present study, in contrast to the results of Alarcón et al.[33] as well as Teh and Ling,[36] while a higher damage index at the last visit was associated with an increased risk of mortality in this study, which is in agreement with other studies.[33,36]

Juvenile-onset SLE is characterized by being generally more severe than adult-onset SLE, with more renal and hematological involvement and a higher standardized mortality ratio (18.3 in juvenile SLE versus 3.1 in adult-onset SLE); however, among the SLE population, the overall mortality rate in the juvenile-onset SLE group was 0.5/100 patient years, lower than in the adult-onset group (10.7/100 patient years).[37] A Brazilian study found that mortality rates were not significantly different between childhood-onset, adult-onset and elderly-onset SLE.[28] In line with the previous studies, juvenile-onset SLE was not found to be a predictor of mortality.

Thrombotic complications related to the antiphospholipid antibody syndrome are a major cause of morbidity and mortality in SLE;[32] however, in the present study, antiphospholipid antibody syndrome was not found to predict mortality.

To conclude, the present study revealed a lower mean age at SLE onset and a higher prevalence of oral ulcers, serositis and nephritis compared to other studies around the world; however, as this is a single-center study, referral bias cannot be excluded. Also, the retrospective design is a limitation of this study. Since not all patients were tested for the different antibodies, the results may not reflect their actual prevalence. Renal impairment and end-stage renal disease, autoimmune hemolytic anemia and thrombocytopenia, as well as higher corticosteroid doses and cyclophosphamide use for more than six months, were identified as

Table 5 Comparison of the studied systemic lupus erythematosus patients to studies from Europe, North America, Latin America, Africa and Asia.

Parameter	*Our series*	*Europe*[20]	*USA*[21]	*Latin America*[22]	*Brazil*[23]	*South Africa*[24]	*Pakistan*[25]	*China*[26]
No. of patients	770	1000	256	1214	888	111	196	709
Mean age at onset (O)/diagnosis (D)	22.1	29 (O)	38.9 (D)	28 (O)	29.9 (O)	35.1 (D)	31(D)	30.1 (D)
± standard deviation	8.6	13	14.8	12	9.5	—	—	12.1
F:M	11:1	10:1	9.6:1	8.8:1	11.3:1	12.8:1	7.2:1	9.3:1
Malar rash	58.3	58	38	61.3	83.2	55	29	56
Discoid lupus	7.5	10	15	1.8	8.2	28.8	14	12
Photosensitivity	34.8	45	39	56.1	76.9	33.3	6	35
Oral ulcers	52.5	24	17	41.7	23.2	21.6	19.7	11
Arthritis	80.3	84	75	93.2	87.4	62.2	38	84
Serositis	55.2	36	42	—	26.7	28.2	22	19
Pleuritis	48.7	—	37	22.1	18.7	—	17	—
Pericarditis	18.6	—	14	17.2	10.9	—	9	—
Nephritis	67.8	39	25	51.7	36.9	48.6	33	50
Neuropsychiatric	44.3	27	7	11.4	9.7	17.1	26	—
Seizures	13.3	—	5	8.1	1.6	8.7	14	3
Psychosis	13.4	—	2	4	8.1	13.5	15	3
Hematological	64.9	—	—	75.2	44	60.5	—	—
Hemolytic anemia	18.8	8	11	11.8	8.7	—	—	20
Leukopenia	34.3	—	18	42.3	18.5	34	22	32
Thrombocytopenia	21.8	22	11	19.2	14.5	43	26	25
Lymphopenia	40.5	—	21	59.3	26.1	25.7	54	—
ANA	94.3	98	98	97.9	100	98.2	86	—
Anti-dsDNA	74.8	78	27	70.5	35.1	66.7	74	65
Anti-Sm	11.0	10	13	48.4	21.8	44.2	50	12
aCL	29.5	—	43	—	13	44.4	—	—
aCL IgG	24.9	24	—	50.6	7.2	44.4	—	42
aCL IgM	23.3	13	—	39.2	—	11.1	—	12
LA	19.8	15	—	30.4	5.5	—	—	16

ANA: antinuclear antibody; anti-dsDNA: anti-double stranded DNA; anti-Sm, anti-Smith; aCL: anticardiolipin; LA: lupus anticoagulant; USA: United States of America.
[a]Age is presented as median.

predictors of mortality. Survival rates among SLE patients are comparable to most studies around the world.

Declaration of conflicting interests

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