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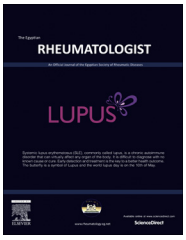

ORIGINAL ARTICLE

Major depression and disease activity among systemic lupus erythematosus Egyptian females

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KEYWORDS

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Abstract *Aim of the work:* The aim of this study was to identify the relationship between disease activity in SLE Egyptian females and the presence, severity and pattern of major depression in these patients.

Patients and methods: The study sample included 100 female patients; fifty SLE patients and fifty healthy adults with matching age serving as control. Patients were assessed using Beck Inventory Score for the presence of major depression, SLEDAI to determine disease activity, SLICC/ACR damage index and HAQ score for functional disability.

Results: The majority of patients had symptoms of major depression 32/50 (64%) based on Beck Inventory Score while in controls only 16/50 (36%) had major depression. The most common depressive symptoms in SLE patients were: Guilty feeling (92%), Self-dislike (91.6%), Self-criticalness (90.4%), Crying spells (87.5%), Loss of pleasure (83.3%), Change in appetite (83.3%), Agitation (82.8%) and Pessimism (82%). Patients with major depression presented a trend toward having greater severity of SLE disease activity compared with those without major depression ($p = 0.04$). The presence of major depression was significantly associated with functional disability measured by HAQ score ($p = 0.01$). The patients with major depression did not differ significantly from patients without major depression regarding their steroid dosage ($p = 0.55$), SLICC/ACR damage score ($p = 0.16$) and disease duration ($p = 0.69$) but differed significantly as regards Beck Hopelessness Scale ($p < 0.0001$) and suicidal ideation score ($p = 0.009$).

Conclusion: Major depression was highly presented in Egyptian SLE patients (64%); its severity was associated with disease activity, but not with steroid administration, cumulative damage or disease duration.

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1. Introduction

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease which usually affects multiple organ systems including the central nervous system (CNS) [1]. SLE is potentially disabling and many challenges are associated with coping with this chronic disease and the treatment regimen. Thus, SLE can have severe impact on individual quality of life and pose serious obstacles to achieving life goals in young individuals who are mostly affected [2]. Neuropsychiatric SLE (NPSLE) refers to the various psychiatric and neurologic manifestations that develop secondary to involvement of the CNS in patients with SLE [3].

Neuropsychiatric manifestations of SLE have been reported in Egyptian patients including seizures, mood affection, cognitive impairment, psychosis, headache, neuropathy and stroke [4,5]. Cognitive dysfunction is a prominent manifestation in NPSLE. Neuropsychiatric deficits and memory impairment in SLE patients affect their daily activities [6]. Cognitive dysfunction was also found to be a prominent feature in asymptomatic SLE Egyptian patients [7] and depression has been reported in 13.3% in another study [8].

Major depression is one of the most frequent psychiatric disorders observed in patients with SLE, with point prevalence rates between 10.8% and 39.6%, which is much higher than in the general population [9]. Depression in SLE is multifactorial. Major depression may be linked to neurotransmitter dysfunction and immune activation (lymphocyte abnormalities and cytokine expression) [10,11]. A recent study has shown that high dose prednisone ($\geqslant$20 mg daily) is one important independent risk factor and also cutaneous activity and certain types of neurologic activity (myelitis) are predictive of depression [12]. Depression in SLE aggravates fatigue, pain and psychological stress, and reduces drug compliance, leading to significant further impairment of quality of life and work disability [13,14]. The severity of depression may also increase the risk of suicidal thoughts [15,16].

The aim of this work is to evaluate the presence of major depressive disorders and the contributing factors to it in Egyptian female patients with systemic lupus erythematosus and also identify the association between SLE disease activity and depression severity.

2. Patients and methods

One hundred female participants were enrolled in the present study. They were all recruited from the Rheumatology and Rehabilitation both inpatient and outpatient clinics at Kasr Al-Ainy Hospital, Cairo University. Participants were divided into 2 groups: in Group (A) the studied sample included fifty SLE female patients fulfilling the ACR diagnostic criteria [17]. Only adult females (above 18 years old) without past history of psychiatric illness or serious medical illness were selected. Group (B): 50 adults served as control and were selected from workers at Kasr Al-Ainy matched for age, education and socioeconomic status. The study was submitted and approved by the Ethics Committee. Participants gave their oral and written consents after informing them about the goals, methods and expected benefits of the study.

Participants' socio-demographic data were gathered including age, educational level, employment and marital status. All Lupus patients underwent history taking, full clinical examination and laboratory investigations (including erythrocyte sedimentation rate, complete blood count, liver and kidney function tests, urine analysis and autoimmune profile tests). Assessment of disease activity was done using systemic lupus disease activity index (SLEDAI) scoring system [18] and patients were classified as inactive, having mild, moderate or severe activity. Also Assessment of organ damage was carried out using the Systemic Lupus Collaborating Clinics/ACR damage index (SLICC/ACR DI) [19] and of functional disability using the Health Assessment Questionnaire (HAQ) [20].

Psychometric assessment tools: A psychiatrist interviewed the patients and control three days weekly. He evaluated depression using the Beck Depression Inventory Score (BDS) [21]: 21 groups of statements on a 4 point scale. The score ranges from (0 to 63) where higher scores denote greater severity of depression. He also used the Beck Hopelessness Scale (BHS) [22] to assess hopelessness using a questionnaire that consists of twenty true or false questions. This scale ranges from (0 to 20), where mild cases range from (4 to 8), moderate cases (9 to 14) and severe cases (15 to 20).The intensity of suicidal thoughts during the preceding week was assessed by the Beck Suicidal Ideation Scale (BSI) [23]. This is a 19 item self-report questionnaire. Each question scores (0 to 2) and the score ranges from (0 to 38) with higher scores indicating more intense suicidal ideation.

Statistical analysis: Descriptive analysis of the results was done using (minimum, maximum, median, mean and standard deviation). Comparison between the study groups was performed using Chi square test. The Fisher Exact test was used instead when the expected frequency was less than 5. Correlation between different variables was carried out using the Spearman correlation equation. All statistical analysis was performed using SPSS 15.0 (Statistical package for the Social Science, USA). Statistical significance was defined as a p value < 0.05.

3. Results

Fifty SLE patients were included in our study, their age ranged from 19 to 45 years old with a mean of 27.9 $\pm$ 6.28 and their disease duration ranged from 0.41 to 19 years with a mean of 5.5 $\pm$ 4.5 years. Details of the socio-demographic features of the SLE patients are shown in Table 1. The clinical manifestations, immune profile and disease activity are presented in Table 2. 22% of the patients had mild to moderate activity on the SLE disease activity index while 24% had severe activity. According to the SLICC/ACR DI, hand deformity and DVT were present in 4%, osteoporosis & avascular necrosis, peripheral neuropathy, epilepsy and end stage renal disease in 2%.

Thirty-two (64%) SLE patients had major depression (MD) according to the Beck Depression Score. On the other hand, sixteen (36%) of the control suffered from major depression. Based on the Beck Hopelessness Scale; 34%, 14% and 22% of the patients were found to have mild, moderate and severe levels of hopelessness respectively and 20% of the patients showed symptoms of suicidal probability (Table 3). There was no significant difference in the socio-demographic features between the SLE patients with and without major depression. The BHS ranged from 0 to 18 with a median of 10 in MD

Table 1 Socio-demographic features of the female systemic lupus erythematosus (SLE) patients.

Features *n* (%)	SLE patients ($n = 50$)
Marital status	
Single	17 (34)
Married	31 (62)
Divorced	2 (4)
Education	
Not educated	8 (16)
Primary school	12 (24)
Secondary school	8 (16)
Diploma	14 (28)
University	8 (16)
Work	
Working	8 (16)
Not working	42 (84)
Socio-economic	
Low	39 (78)
Average	11 (22)

SLE: systemic lupus erythematosus.

Table 2 Clinical manifestations, laboratory features and disease activity of the systemic lupus erythematosus (SLE) patients.

	Parameter	SLE patients ($n = 50$)
Clinical manifestations	Fever	10 (20)
	Fatigue	26 (52)
	Weight loss	10 (20)
	Malar rash	36 (72)
	Photosensitivity	29 (58)
	Oral ulcer	30 (60)
	Arthritis	41 (82)
	Serositis	12 (24)
	Neuropsychiatric	10 (20)
	Renal	25 (50)
	Deep venous thrombosis	5 (10)
Hematological	Anemia	18 (36)
	Leukopenia	20 (40)
	Thrombocytopenia	8 (16)
	Pancytopenia	5 (10)
Immune profile	ANA positivity	50 (100)
	DNA positivity	43 (86)
	APL positivity	11 (22)
	Anti Ro/La positivity	5 (10)
	C3 and C4 consumption	23 (46)
SLEDAI	Inactive < 2	27 (54)
	Mild to moderate (2–20)	11 (22)
	Severe > 20	12 (24)

SLE: systemic lupus erythematosus, SLEDAI: SLE disease activity index.

patients and the BSI ranged from 0 to 17 while in those without MD, the BHS ranged from 0 to 7 and none of them had suicidal ideation. Patients with MD had significantly higher BHS ($p < 0.0001$) and BSI ($p = 0.009$) than those patients with no major depression (NMD). On comparing different disease parameters between those with MD and those with NMD, the SLEDAI ($p = 0.04$) and HAQ ($p = 0.01$) were significantly higher in those with MD than in those without. However, no significant difference was found as regards the disease duration, steroid dosage and SLICC/ACR DI (Table 4).

Table 3 Beck scores of psychological parameters of systemic lupus erythematosus (SLE) patients.

Beck scores *n* (%)	SLE patients ($n = 50$)
Depression	
No Major depression	18 (36)
Major depression	32 (64)
Hopelessness Scale	
No symptoms (0–4)	15 (30)
Mild (>4–8)	17 (34)
Moderate (>8–14)	7 (14)
Severe (>14–20)	11 (22)
Suicidal Ideation Scale	
No symptoms of suicide probability	40 (80)
Symptoms of suicide probability	10 (20)

SLE: systemic lupus erythematosus.

Table 4 Comparison between systemic lupus erythematosus (SLE) patients with and without major depression as regards different disease parameters.

Parameter Median (range)	MD ($n = 32$)	NMD ($n = 18$)	*p*
Disease duration (y)	4 (0.5–17)	5 (0.5–19)	0.69
Steroid dosage (mg/d)	20 (5–1000)	20 (5–60)	0.55
SLEDAI	15 (0–29)	8 (0–13)	**0.04**
SLICC/ACR DI	0 (0–3)	0 (0–3)	0.16
HAQ score	0.3 (0–1.5)	0 (0–1.2)	**0.01**

MD: major depression, NMD: no major depression, SLEDAI: SLE disease activity index, SLICC/ACR DI: systemic lupus international collaborating clinics/American College of Rheumatology Damage Index, HAQ: Health Assessment Questionnaire. Bold values are significant at $p < 0.05$.

The most common depressive symptoms among SLE patients were: Guilty feeling (92%), Self-dislike (91.6%), Self-criticalness (90.4%), Crying spells (87.5%), Loss of pleasure (83.3%), Change in appetite (83.3%), Agitation (82.8%), Pessimism (82%), Tiredness or fatigue (72.9%), Loss of energy (72.5%) and Sadness (72%). However the most common symptoms of depression in the control group were sadness (30%), loss of energy (28%) and tiredness (24%) (Fig. 1). The severity of some of the symptoms in the Beck Depression Score is represented in Table 5. These symptoms were significantly higher in the SLE patients compared to the control group. Other symptoms including sense of failure, social withdrawal, sleep disturbances, weight loss, etc. showed no significant difference when compared between the two groups.

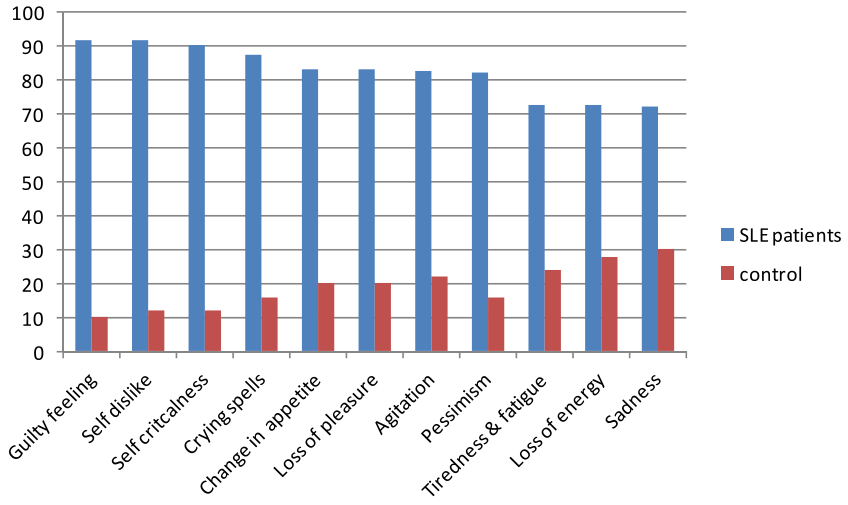

Figure 1 Comparison between patterns of depression among systemic lupus erythematosus (SLE) patients and control group.

4. Discussion

The majority of patients had symptoms of major depression 32/50 (64%) based on Beck Inventory Score while in control group only 16/50 (36%) had major depression. The percentage of patients suffering from depression measured by BDS scores in our sample was 64%, which was higher than the prevalence described by other studies conducted among SLE patients 16% [24], 23.34% [25], 30% [26], 40.5% [27], 39– 46% [28], 49% [29] and 60% in a recent study [15].

The difference observed may be due to various methodologies, patient samples, studies were conducted among women only, sample sizes, and different cultural and social backgrounds [28]. On measuring the activity of the disease by SLEDAI score, it was found that 46% (23/50) of SLE patients had active disease, 65% with MD and 35% without major depression. It was found that the severity of depression was associated with disease activity, but not with steroid administration, age or disease duration. This was consistent with the study done by Zakeri and colleagues [15], where in total, 60% of patients achieved scores indicating depression. These results were consistent with the studies conducted by others [27,29,30]. Patients with MD showed significant higher mean BHS ($p < 0.0001$) and BSI ($p = 0.009$) compared to NMD. This was consistent with many studies done [15,16,24–27]. According to Beck's assumption, hopelessness appeared to be a mediator between depressive symptoms and the wish to kill oneself. These findings are relevant for prevention and therapy. They suggest that targeting hopelessness may be as important in adolescents as in adults to reduce suicidal ideation and prevent suicidal attempts.

SLE is potentially disabling [28] and depression can aggravate disability, absence from work, in addition to reducing drug compliance, increasing utilization of health care services and the risk of suicide [29–38]. This is in line with our study where SLE patients with MD reported more disability (measured by HAQ) compared with those without MD ($p = 0.01$). On the other hand patients with MD showed no significant difference from NMD patients as regards the SLICC/ACR DI ($p = 0.16$), which indicates that the

Table 5 Comparison between systemic lupus erythematosus (SLE) patients and control as regards severity of patterns of depression.

	BDS symptoms	Major depression in		*p*
		SLE ($n = 32$)	Control ($n = 16$)	
Sadness	No	0 (0)	5 (31.3)	**< 0.001**
	Mild	8 (25)	8 (50)	
	Moderate	13 (40.6)	0 (0)	
	Severe	10 (31.3)	3 (18.8)	
	Very severe	1 (3.1)	0 (0)	
Pessimism	No	11 (34.4)	12 (75)	**< 0.001**
	Mild	6 (18.8)	4 (25)	
	Moderate	3 (9.4)	0 (0)	
	Severe	9 (28)	0 (0)	
	Very severe	3 (9.4)	0 (0)	
Loss of pleasure	No	2 (6.3)	10 (62.5)	**< 0.05**
	Mild	7 (21.9)	3 (18.8)	
	Moderate	10 (31.3)	1 (6.3)	
	Severe	8 (25)	2 (12.5)	
	Very severe	5 (15.6)	0 (0)	
Guilty feeling	No	19 (59.4)	15 (93.8)	**< 0.001**
	Mild	1 (3.1)	0 (0)	
	Moderate	12 (37.5)	1 (6.3)	
	Severe	0 (0)	0 (0)	
Self dislike	No	10 (31.3)	14 (87.5)	**< 0.05**
	Mild	7 (21.9)	2 (12.5)	
	Moderate	4 (12.4)	0 (0)	
	Severe	4 (12.4)	0 (0)	
	Very severe	7 (21.9)	0 (0)	

Table 5 (*continued*)

	BDS symptoms	Major depression in		*p*
		SLE ($n = 32$)	Control ($n = 16$)	
Self criticalness	No	13 (40)	14 (87.5)	**0.001**
	Mild	5 (15.6)	1 (6.3)	
	Moderate	5 (15.6)	0 (0)	
	Severe	8 (25)	1 (6.3)	
	Very severe	1 (3.1)	0 (0)	
Crying spells	No	4 (12.5)	12 (75)	**< 0.05**
	Mild	7 (21.9)	1 (6.3)	
	Moderate	7 (21.9)	1 (6.3)	
	Severe	11 (34.4)	1 (6.3)	
	Very severe	3 (9.4)	1 (6.3)	
Agitation	No ($n = 15$)	3 (9.4)	9 (56.3)	**0.001**
	Mild ($n = 7$)	4 (12.5)	3 (18.8)	
	Moderate ($n = 7$)	6 (18.8)	1 (6.3)	
	Severe ($n = 21$)	19 (59.4)	3 (18.8)	
Loss of energy	No	3 (9.4)	6 (37.5)	**0.002**
	Mild	7 (21.9)	4 (25)	
	Moderate	10 (31.3)	6 (37.5)	
	Severe	10 (31.3)	0 (0)	
	Very severe	2 (6.3)	0 (0)	
Tiredness & fatigue	No	5 (15.6)	7 (43.8)	**0.04**
	Mild	3 (9.4)	3 (18.8)	
	Moderate	6 (18.8)	3 (18.8)	
	Severe	11 (34.4)	2 (12.5)	
	Very severe	7 (21.9)	0 (0)	
Change in appetite	No	7 (21.9)	11 (68.8)	**0.001**
	Mild	11 (34.4)	3 (18.8)	
	Moderate	6 (18.8)	3 (18.8)	
	Severe	8 (25)	0 (0)	

BDS: Beck Depression Score. Bold values are significant at $p < 0.05$.

functional disability resulted from depression rather than damage caused by the disease itself.

In the current study the most frequently reported symptoms were guilty feeling, self-dislike, self-criticalness and spells of crying which are closely related to depression. This is different from the study carried by Zakeri et al. [15] in which weakness and fatigue (87.2%), irritability (80.8%), and sadness (75.6%) were the most prevalent symptoms. Well this could be explained by the fact that that weakness and fatigue are somatic symptoms that may accompany SLE and may not be related to the mental state of the patient.

Twenty percent of the SLE patients in our sample showed a high score of suicidal ideation. This frequency is greater than that reported in Hong Kong (12%) [31] the Middle East (10.5%) [15], Chile (9.6%) [38] and Japan (8.4%) [39] and could be related to the higher disease activity of our SLE patients (25% of patients had SLEDAI scores $\geqslant 20$). It is documented that SLE patients with active disease are more likely to be depressed [40]. Moreover, the socio-economic status and educational level of our patients was lower than those in the previously mentioned studies which might be another contributing factor to the higher prevalence of suicidal ideation in our study.

In conclusion, depression is highly presented among SLE Egyptian patients. The severity of depression is associated with disease activity and patients with major depression report more disability. Hence, psychiatric assessment of SLE patients should be considered as part of their clinical evaluation. Early detection and intervention in management of depression could have dramatic impact in controlling disease activity and the patients' quality of life. Patients should be informed of available support groups and referred to psychiatric rehabilitation centers whenever indicated.

Conflict of interest

None.

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