

Relationship of Socioeconomic Status, Depression and Disease Activity in Patients with Systemic Lupus Erythematosus

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ABSTRACT

Systemic lupus erythematosus has different presentations and the outcome of this illness is variable. It is associated with significant psychological distress and the outcome of this disease has been shown to be influenced by socioeconomic factors.

Objective: To determine the association between socioeconomic status, depression and disease activity in patients with systemic lupus erythematosus.

Methodology: It was a cross sectional study carried out at department of Rheumatology, Mayo Hospital, Lahore. 150 patients with systemic lupus erythematosus who fulfilled the inclusion criteria were enrolled. Demographic detail, clinical history and examination findings were noted down. Socioeconomic status was assessed by history, depression was assessed by Beck Depression Inventory and disease activity was assessed by SLEDAI-2K and findings were noted down and was subjected to statistical analysis.

Results: The mean age of the patients was 29.12±7.44, mean BDI score was 19.2±10.7 and mean SLEDAI-2K score was 9.94±4.91. There were 33.7% males and 66.3% females. Depression was present in 32% of the patients. Depression was more common in patients with higher scores of disease activity. This association between depression and its severity and the disease activity was found to be statistically significant as indicated by a p value of 0.04. The scores of disease activity were found to be higher in patients who were of middle socioeconomic status and low socioeconomic status i.e. in 48% and 34% respectively and the association was statistically significant (p-value 0.000).

Conclusion: Depression, socioeconomic status and disease activity are significantly associated with each other in patients with systemic lupus erythematosus and must be screened in every patient.

Keywords: Systemic Lupus Erythematosus, Depression, Socioeconomic status, disease activity

INTRODUCTION

Systemic lupus erythematosus (SLE) is a heterogeneous disease, which is autoimmune in nature¹. It is manifested variedly and has different outcomes. Although prognosis of the patients with this illness has improved over the past decades as a result of recent advances, still recent literature shows that the risk of mortality is twice in patients with systemic lupus erythematosus as compared to the general population². There is high burden of disease related morbidity as well. An individual who has SLE has to face various issues related to physical health, psychological well-being or stability socioeconomically^{1,3}.

SLE individuals have major concerns about pain that is persisting, their inability to work and the effects of treatment that is given for long term period, all together leading to psychological issues³.

Majority of the patients suffering from systemic lupus erythematosus have psychiatric symptoms⁴. Among psychiatric issues, depression is commonly encountered in such patients, especially in women. It has been estimated that depression may occur as an initial symptom of this illness in about 11-39%¹ of individuals and is more frequently encountered in females. Presence of depression in such patients is said to be associated with greater activity of disease, functional disability and vascular disease markers and a decrease quality of life that is related to health^{4,5}.

Another factor that is employed broadly in research related to health is socioeconomic status^{1,4,5}. It has been shown that socioeconomic status is important for good outcomes related to health. The studies carried out previously has shown that lower socioeconomic status is associated with poor disease outcomes in patients with SLE^{1,5}. The association of psychological and socioeconomical factors with disease activity is still debatable in patients with SLE.

A lot of international studies have been carried out to look for association between psychological factors and disease activity in patients with SLE. However, local data is lacking. So the aim of current study was to determine the association between socioeconomic status, depression and disease activity in patients with systemic lupus erythematosus. This study will help in

providing data about the psychological issues and social status about the patients that can affect the outcome and disease, and thus if addressed earlier can help in reducing further morbidity that is associated with the disease.

METHODOLOGY

It was a cross-sectional study. The study was carried out in the department of Rheumatology, Mayo Hospital, Lahore from January 2020 till June 2020. A total of 150 patients were enrolled in the study keeping expected percentage of depression in SLE patients as 11% and taking 95% confidence interval and 5% margin of error. Non-probability consecutive sampling technique was used. Patients who were diagnosed as having systemic lupus erythematosus, between age 18-40 years and of both genders were included in the study. Systemic erythematosus was labeled if a patient score >10 on the Classification criteria for systemic lupus erythematosus by European League Against Rheumatism (EULAR) and the American College of Rheumatology (ACR) [figure 1]. Depression was assessed on Beck Depression Inventory and a score of ≥11 was considered as clinical depression. Socioeconomic status was assessed on basis of history from the patient about the average income per month and was categorized as low socioeconomic status if average income was <10,000/month, middle socioeconomic if average income was 10,000 to 50,000 per month and was labeled as high socioeconomic status if average income was >50,000 per month. Disease activity was assessed by systemic lupus erythematosus disease activity index 2000 (SLEDAI-2K) and a cut off score of ≥4 was labeled as active disease and was categorized as mildly active if score was 4-5, moderately active if score was 6-12 and severely active if score was 13-20. Patients with a history of comorbid medical condition such as severe infection, cardiac, respiratory, gastrointestinal, neurological or endocrinal issues were excluded.

150 patients who fulfilled the inclusion criteria were enrolled in the study after taking approval from ethical review board of the institution and written informed consent from all the patients. Demographic details, clinical history and examination were carried out in all patients and findings were noted down on a predesigned

performa. Baseline investigations were carried out too to rule out other comorbidities. All participants were assessed for depression based on BDI scale and findings were noted down. Disease activity was also assessed as well as socioeconomic status and findings were noted down and was subjected to statistical analysis.

Data was analyzed using SPSS version 24.0. Quantitative data such as age, BDI score, SLEDAI-2K score were presented as mean and standard deviation. Qualitative data such as gender, depression, severity of depression, socioeconomic status, severity of disease activity, and duration of illness were presented as frequency and percentages. Association between depression, socioeconomic status and disease activity was determined by Chi square test. Data was stratified for age, gender, duration of illness. Post-stratification chi square test was applied to deal with effect modifiers and a P-value of ≤ 0.05 was considered significant.

Entry criterion			
Antinuclear antibodies (ANA) at a titer of $\geq 1:80$ on HEp-2 cells or an equivalent positive test (ever)			
↓			
If absent, do not classify as SLE If present, apply additive criteria			
↓			
Additive criteria			
Do not count a criterion if there is a more likely explanation than SLE. Occurrence of a criterion on at least one occasion is sufficient. SLE classification requires at least one clinical criterion and ≥ 10 points. Criteria need not occur simultaneously. Within each domain, only the highest weighted criterion is counted toward the total score.			
Clinical domains and criteria	Weight	Immunology domains and criteria	Weight
Constitutional		Antiphospholipid antibodies	
Fever	2	Anti-cardiolipin antibodies OR	
		Anti- $\beta 2$ GP1 antibodies OR	
Hematologic		Lupus anticoagulant	2
Leukopenia	3	Complement proteins	
Thrombocytopenia	4	Low C3 OR low C4	3
Autoimmune hemolysis	4	Low C3 AND low C4	4
Neuropsychiatric		SLE-specific antibodies	
Delirium	2	Anti-dsDNA antibody* OR	
Psychosis	3	Anti-Smith antibody	6
Seizure	5		
Mucocutaneous			
Non-scarring alopecia	2		
Oral ulcers	2		
Subacute cutaneous OR discoid lupus	4		
Acute cutaneous lupus	6		
Serosal			
Pleural or pericardial effusion	5		
Acute pericarditis	6		
Muculoarticular			
Joint involvement	6		
Renal			
Proteinuria $>0.5g/24h$	4		
Renal biopsy Class II or V lupus nephritis	8		
Renal biopsy Class III or IV lupus nephritis	10		
Total score:			
↓			
Classify as Systemic Lupus Erythematosus with a score of 10 or more if entry criterion fulfilled.			

Figure 1: Classification criteria for systemic lupus erythematosus by European League Against Rheumatism (EULAR) and the American College of Rheumatology (ACR)

RESULTS

The mean age of the patients was 29.12 ± 7.44 , mean BDI score was 19.2 ± 10.7 and mean SLEDAI-2K score was 9.94 ± 4.91 (table 1). There were 33.7% males and 66.3% females. The frequencies and percentages of qualitative variables are presented in table 2.

In patients who were very mildly depressed, mild disease activity was present in 2% patients, 18% had moderate activity and 5.3% had severe disease activity. In patients with mild depression, only moderate and severe disease activity was present in 5% of patients. In patients with moderate depression, 1.3% had mild disease activity, 11.3% had moderate and 9.3% had severe disease activity. In those who were severely depressed, 1.3% mild, 3.3% moderate and 0.7% severe disease activity and in those who were extremely depressed 4% had moderate and 0.7% had severe disease activity. This association between depression and its severity and the disease activity was found to be statistically significant as indicated by a p value of 0.04.

The scores of disease activity were found to be higher in patients who were of middle socioeconomic status and low socioeconomic status i.e. in 48% and 34% respectively. Patients belonging to these classes were mainly having moderate to severe disease activity i.e. among patient with middle socioeconomic

status 29.3% had moderate and 18.7% had severe disease activity and among those with low socioeconomic status 15.3% had moderate and 9.3% had severe disease activity. This association between socioeconomic status and disease activity was also statistically significant as indicated by a p value of 0.000.

Age and gender did not have significant effects on the results as indicated by p value of >0.05 , however, duration of illness was significantly associated with severity of disease activity and it was found that disease activity was on the higher sides in patients who had duration of illness of >1 year and this association was significant (p value 0.000).

Depression was found to be significantly associated with socioeconomic status (p-value 0.001). It was found that 2% of the low, 3.3% of middle, and 1.3% of the high socioeconomic status patients had mild depression. 10.7% of the low, 12% of middle and 2.7% of high socioeconomic status patients had depression of moderate intensity. Severe depression was present in all socioeconomic status patients with the frequency of 2%. Among patients who were extremely depressed, 0.7% had low socioeconomic status and 4% had middle socioeconomic status.

In patients who were of young age, very mild, mild, moderate, severe and extremely severe depression was found in 8.7%, 2.7%, 11.3%, 2% and 0.7% respectively patients and in those who were of middle age, the rates were 16.7%, 4%, 14%, 4% and 4% respectively. This association between variability in severity of depression at different age was not statistically significant (p value 0.267).

Among females, 18% had very mild depression, 2.7% had mild, 19.3% had moderate, 4% had severe and 4.7% had extremely severe depression in comparison to males in which very mild depression, mild depression, moderate depression, severe depression and extremely severe depression was found in 7.3%, 4%, 6%, 2% and 0% respectively. Depression was more frequent in female patients with systemic lupus erythematosus and this association was significant as indicated by p value 0.05.

Depression was more common in patients in whom the duration of illness was long (1-5 years) and extremely long duration (>5 years) i.e. 37.3% and 18.6% respectively. However, this association was not significant.

Table 1: Showing Mean And Standard Deviation (Sd) Of Quantitative Variables

Variables	Mean \pm sd (n=137)
Age (in years)	29.12 \pm 7.44
BDI score	19.2 \pm 10.7
SLEDAI-2k score	9.94 \pm 4.91

Table 2: Showing Frequency And Percentage Of Qualitative Variables

Variables	Frequency (percentage) N=137	P-value
Age groups		
Young age (18-30 years)	64 (42.7%)	0.838
Middle age (31-40 years)	86 (57.3%)	
Gender		
Male	50 (33.3%)	0.001*
Female	100 (66.7%)	
Depression		
Yes	48 (32%)	0.04*
No	89 (68%)	
Severity of Depression		
No clinical depression	38 (25.3%)	0.04*
Very mild depression	10 (6.7%)	
Mild depression	38 (25.3%)	
Moderate depression	9 (6%)	
Severe depression	7 (4.7%)	
Extremely severe depression		
Socioeconomic status		
Low	65 (43.3%)	0.000*
Middle	72 (48%)	
High	13 (8.7%)	
Disease activity		

No activity	14 (9.3%)	0.000*
Mild	14 (9.3%)	
Moderate	77 (51.3%)	
Severe	45 (30%)	
Duration of illness		
Short duration (<1year)	28 (18.7%)	
Long duration (1-5 years)	83 (55.3%)	
Extremely long duration (>5years)	39 (26%)	

*P value of ≤ 0.05 was considered significant

DISCUSSION

The current study revealed that depression was significantly associated with disease activity and was present in 32% of patients with systemic lupus erythematosus. Those who were of low and middle socioeconomic status had higher scores of disease activity and this association was found to be significant. Duration of illness and gender both had significant association with disease activity and it was found that moderate to severe disease activity (28% and 24.7%) was found more in patients who long duration of illness i.e. between 1-5 years and in those who had duration of illness of >5 years, moderate disease activity was more prevalent i.e. in 16%. Age did not have any significant association with disease activity. Significant association was found between depression and socioeconomic status as well as depression and gender.

Studies conducted in the past have yielded similar results. Shen B, et al in 2013 determined the prevalence of psychological issues in patients with SLE and determined association between parameters of disease, quality of life and the psychological wellbeing in patients with SLE in Chinese population¹. The results revealed that anxiety was present in 20.3% patients whereas depression was present in 32.9% patients. Significant association was found between depression, disease activity and socioeconomic status in patients of SLE¹. The results of current study are similar to results of this study. In another study by Maneeton B, 2013, the rate of prevalence and the factors predicting depression were determined in systemic lupus erythematosus patients. The authors found that anxiety was present in 37.1% patients whereas depression was present in 45.2% of SLE patients². The significant predictors of depression were mainly younger age and HAM-A score i.e. anxiety score. Our study also revealed higher prevalence of depression in SLE patients and significant amount of young patients was depressed i.e. 25.3%.

Severity of SLE indicated by disease activity is also associated with depression. In a study of 71 females who had SLE, it was found that disease activity was associated significantly with depression and its severity as was measured by MADRS. Our study also revealed significant statistical association between disease severity and depression, revealing that depression was more common in those with moderate to severe disease activity.

The current study had certain limitations. Firstly, it was conducted at a single center so the results cannot be generalized. Secondly, the small size could not reflect the whole population. Thirdly, the role of medications used for SLE treatment were not evaluated for association with depression. Lastly, patients who had comorbidities were not assessed for effect on disease severity and depression.

CONCLUSION

The current study concluded that depression, socioeconomic status and disease activity are significantly associated with each other in patients with systemic lupus erythematosus. Higher rates of depression were seen in patients who had higher levels of disease activity and were of lower socioeconomic status. Future studies should be carried out on larger sample size to generalize the results. All patients with SLE should be routinely screened for the presence of depression, so that early treatment is provided and further morbidity is reduced. Low socioeconomic status was also associated with more disease severity and depression and should

be considered while managing such patients, so that help can be extended further to this group of individuals by provision of basic medical care.

Conflict of Interest: none

Ethical Approval: obtained

Sources of Funding: none

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