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Research Article

### DETERMINE THE FREQUENCY AND ASSOCIATED RISK FACTORS OF COGNITIVE IMPAIRMENT IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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**Abstract:**

**Objective:** To determine the frequency of cognitive impairment and its associated risk factors in patients presented with systemic lupus erythematosus.

**Study Design:** Cross-sectional study

**Place and Duration:** Department of Medicine, Chandka Medical College Hospital Larkana from 1<sup>st</sup> July 2018 to 31<sup>st</sup> December 2019.

**Methods:** Ninety five patients of either gender presented with systemic lupus erythematosus were enrolled in this study. Patients detailed medical history, demographics including age, sex, education level, socioeconomic status and co-morbidities were recorded after taking informed written consent. Frequency of cognitive impairment was examined by Mini-mental state examination. Predictors of cognitive impairment were examined.

**Results:** Seventy five (78.95%) were females while 20 (21.05%) patients were males. Fifteen (15.79%) patients were ages <30 years, 29 (30.53%) had ages 31 to 45 years, 40 (42.11%) were ages 46 to 60 years and 11 (11.58%) had ages >60 years. Cognitive impairment was found in 22 (23.16%) patients. Among 22 cognitive impairment patients 17 (77.27%) had mild cognitive impairment and 5 (22.73%) had dementia. Cardiovascular disease, disease duration, low socio-economic status, and steroids use were the risk factors significantly associated with cognitive impairment (p-value <0.05).

**Conclusion:** The frequency of cognitive impairment in systemic lupus erythematosus patients was high. Diabetes mellitus, cardiovascular disease, low socio-economic status and hydroxychloroquine were the major risk factors associated with cognitive impairment.

**Keywords:** Systemic lupus erythematosus, Cognitive impairment, Cardiovascular disease, Socioeconomic status, Diabetes mellitus, Steroids.

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**INTRODUCTION:**

Systemic Lupus Erythematosus (SLE) is a severe autoimmune disease whose broad etiology involves genetic, epigenetic, hormonal and immune regulatory factors. The clinical course as well as SLE-related damage is unpredictable. Many organs may be affected, including the brain, where this may cause neuropsychiatric symptoms.<sup>1,2</sup> Cognitive dysfunction is a common neuropsychiatric manifestation of systemic lupus erythematosus (SLE), with prevalence ranging from 21-81%.<sup>3,4</sup> While existing studies have identified a combination of biologic and socioeconomic factors as potential predictors of cognitive impairment, the etiology of cognitive impairment in SLE remains unclear.<sup>5</sup> There is substantial evidence linking cardiovascular disease and Framingham-type risk factors with cognitive dysfunction in the general population. In the Whitehall II Study, for example, coronary heart disease was associated with lower cognitive performance in middle-aged individuals.<sup>6</sup> Another study correlated hypertension and diabetes mellitus with cognitive decline in middle-aged adults.<sup>7</sup> Similar to the general population, prior SLE studies have also implicated hypertension and diabetes as potential predictors of cognitive dysfunction.<sup>5</sup> However, despite the increased burden of premature cardiovascular disease in patients with SLE, the relationship between cardiovascular risk factors and events and cognitive dysfunction has not been fully explored.<sup>8-10</sup> The present study was conducted to examine the frequency of cognitive impairment and associated risk factors in patients presented with systemic lupus erythematosus.

**MATERIALS AND METHODS:**

This cross-sectional/observational study was conducted at Department of Medicine, Chandka Medical College Hospital Larkana from 1<sup>st</sup> July 2018 to 31<sup>st</sup> December 2019. A total 95 patients of both genders with ages 18 to 75 years presented with systemic lupus erythematosus (SLE) were analyzed in this study. Patients detailed demographic including age, sex, education, socio-economic status and co-morbidities such as hypertension, cardiovascular disease, diabetes mellitus, obesity and use of steroids were recorded after taking informed written consent. Patients with known psychiatric illness, patients less than 18 years and those with no consent were excluded. Mini-mental state examination was done to all the patients to examine the frequency of cognitive impairment. Associated risk factors such as hypertension, disease duration, cardiovascular diseases, diabetes mellitus, socio-economic status, Benzodiazepine and hydroxychloroquine were examined. All the data was analyzed by SPSS 24.0. Mean±SD was done. Frequencies and percentages were recorded in table form. Chi-square, student t'

test was done. <0.05 p-value was taken as significant.

**RESULTS:**

Seventy-five (78.95%) were females while 20 (21.05%) patients were males. 15 (15.79%) patients were ages <30 years, 29 (30.53%) had ages 31 to 45 years, 40 (42.11%) were ages 46 to 60 years and 11 (11.58%) had ages >60 years. 52 (54.74%) were literate while 43 (45.26%) patients were illiterate. 64 (67.37%) patients had disease duration <10 years and 31 (32.63%) patients had duration of disease >10 years. 40 (42.11%) patients had low socio-economic status while 55 (57.89%) patients had middle socio-economic status. Hypertension found in 35 (36.84%) patients, cardiovascular diseases found in 24 (25.26%) patients, 26 (27.37%) patients had diabetes mellitus, obesity found in 13 (13.63%) patients and use of steroids found in 22 (23.15%) patients (Table 1). According to the MMSE, 22 (23.16%) patients found to have cognitive impairment while 73 (76.84%) patients had no cognitive dysfunctions (Fig. 1). Among 22 cognitive impairment patients 17 (77.27%) had mild cognitive impairment and 5 (22.73%) had dementia (Table 2). According to the risk factors, disease duration >10 years, hydroxychloroquine, low socio-economic status, cardiovascular disease and diabetes mellitus were the significantly associated risk factors of cognitive impairment P-value <0.05 (Table 3)

**Table 1: Baseline details of all the patients**

Variable	No.	%
<b>Sex</b>		
Male	20	21.05
Female	75	78.95
<b>Age (years)</b>		
≤30	15	15.79
31 – 45	29	30.53
46 – 60	40	42.11
>60	11	11.58
<b>Disease duration (years)</b>		
<10	64	67.37
>10	31	32.63
<b>Education</b>		
Literate	52	54.74
Illiterate	43	45.26
<b>Socioeconomic status</b>		
Low	40	42.11
Middle	55	57.89
<b>Co-morbidities</b>		
Hypertension	35	36.84
CVD	24	25.26
Diabetes Mellitus	26	27.37
Obesity	13	13.68
Hydroxychloroquine Use	22	23.15

Table 2: Type of cognitive impairment (n=18)

Cognitive impairment	No.	%
Mild	17	77.27
Dementia	5	22.73

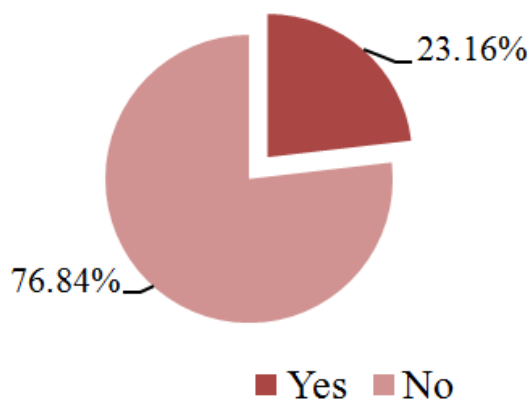


Fig. 1: Frequency of cognitive impairment among SLE patients

Table 3: Associated risk factors of cognitive impairment

Risk factors	Yes	No	P-value
<b>Disease duration (years)</b>			
≤10	10 (45.45)	54 (73.97)	N/S
>10	12 (54.55)	19 (26.03)	0.037
<b>Education</b>			
Literate	10 (45.45)	42 (57.53)	N/S
Illiterate	12 (54.55)	31 (42.47)	N/S
<b>Socioeconomic status</b>			
Low	16 (72.73)	24 (32.88)	0.001
Middle	6 (27.27)	49 (67.12)	
<b>Co-morbidities</b>			
Hypertension	2 (9.09)	33 (45.21)	N/S
CVD	9 (40.91)	15 (20.55)	0.024
Diabetes Mellitus	2 (9.09)	24 (32.88)	N/S
Obesity	1 (4.55)	12 (16.43)	N/S
Hydroxychloroquine use	8 (36.36)	14 (19.17)	0.041

### DISCUSSION:

Systemic lupus erythematosus is one of the common clinical disorder with high morbidity and mortality.<sup>11</sup> Cognitive impairment is the major adverse disorder with high morbidity rate. Many of

studies have been conducted to examine the frequency of cognitive impairment in patients with SLE.<sup>12,13</sup> The present study was also conducted to determine the prevalence and risk factors of cognitive impairment in patients with SLE. In this regard 95 SLE patients were analyzed. In our study 75 (78.95%) were females while 20 (21.05%) patients were males. 15 (15.79%) patients were ages <30 years, 29 (30.53%) had ages 31 to 45 years, 40 (42.11%) were ages 46 to 60 years and 11 (11.58%) had ages >60 years. These results showed similarity to many of previous studies in which female patients population was high 70% to 92% as compared to male patients and majority of patients were ages above 40 years.<sup>14,15</sup> We found that 52 (54.74%) were literate while 43 (45.26%) patients were illiterate. 64 (67.37%) patients had disease duration <10 years and 31 (32.63%) patients had duration of disease >10 years. 40 (42.11%) patients had low socio-economic status while 55 (57.89%) patients had middle socio-economic status. Hypertension found in 35 (36.84%) patients, cardiovascular diseases found in 24 (25.26%) patients, 26 (27.37%) patients had diabetes mellitus, obesity found in 13 (13.63%) patients and use of steroids found in 22 (23.15%) patients. These results were comparable to some previous studies.<sup>16,17</sup>

In present study we found that the frequency of cognitive impairment was 23.16%. Among these 17 (77.27%) had mild CI and 5 (22.73%) had dementia. A study conducted by Iqbal *et al*<sup>18</sup> reported the prevalence of cognitive dysfunction among SLE patients was 20.91%, in which 73.16% patients had mild and 26.09% patients had dementia. Another study by Said *et al*<sup>19</sup> reported that the frequency of cognitive dysfunction in SLE patients was 46.7%. Several other previous studies reported the frequency of cognitive impairment in systemic lupus erythematosus patients was 15% to 50%.<sup>20,21</sup>

In the present study we found that , disease duration >10 years, hydroxychloroquine, low socio-economic status, cardiovascular disease and diabetes mellitus were the significantly associated risk factors of cognitive impairment P-value <0.05. Iqbal *et al*<sup>18</sup> reported chloroquine was the only protective factor associated with cognitive dysfunction while disease duration, education and hypertension were not significantly associated with cognitive dysfunction. Some previous studies demonstrated that cardiovascular diseases were the most important associated risk factor to the cognitive impairment.<sup>22,23</sup> Some of previous studies reported that depression, stress, hypertension and use of steroids were the significantly associated risk factors of cognitive dysfunction [24,25].

**CONCLUSION:**

The frequency of cognitive impairment in systemic lupus erythematosus patients was high. Disease duration above 10 years, cardiovascular disease, low socio-economic status and hydroxychloroquine were the major risk factors associated with cognitive impairment.

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