

Self-reported cognitive function among older adults with systemic lupus erythematosus compared to other rheumatic and musculoskeletal conditions

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BACKGROUND

- Cognitive symptoms such as forgetfulness or “brain fog” are frequently reported by individuals with systemic lupus erythematosus (SLE) and are considered to be among the most distressing symptoms of lupus.
- Cognitive symptoms are also more commonly reported among older adults, but little information is available about how cognitive symptoms among older people with SLE compare to those of similar ages with other rheumatic or musculoskeletal conditions.
- Objectives:
 - (1) Compare self-reported cognitive function among an older cohort of individuals with SLE to individuals with rheumatoid arthritis (RA), osteoarthritis (OA), and fibromyalgia (FM) of similar ages.
 - (2) Examine and the association of cognitive function with self-perceptions of disease status and satisfaction with health.

METHODS

- Data were drawn from FORWARD, The National Databank for Rheumatic Diseases, a longitudinal observational cohort. Data are collected biannually via questionnaires.
- Individuals with physician-diagnosed SLE, RA, OA, FM and SLE + FM, age ≥ 55, were included.
- Cognitive symptoms were assessed with the 8-item NeuroQoL Cognitive Function (NCF) short form¹. NCF items query cognitive symptoms and perceived ability to complete everyday tasks. Raw scores range from 8-40 and were transformed to standardized T-scores with a population mean of 50 and standard deviation of 10. Lower scores reflect worse cognitive functioning. The NCF was administered in 3 biannual surveys.
- We compared NCF scores of individuals with physician-confirmed SLE and no other rheumatic diagnosis to individuals with RA, OA, FM, and SLE + FM using generalized estimating equation (GEE) modeling, adjusting for age, education, pain, fatigue, sleep disturbance, and depressive symptoms.
- Among the SLE-only group, we compared the following for those with and without low NeuroQoL scores (defined as 1 standard deviation below the mean, or ≤40) in both unadjusted and adjusted analyses:
 - Lupus disease: Self-reported lupus disease activity (0-10 scale, 0 = not at all active, 10 = extremely active), organ damage (using the validated Brief Index of Lupus Damage, BILD), and the occurrence of flares in the past 3 months. Adjusted for age, disease duration, pain, sleep, and fatigue.
 - General health and social functioning: Global health status rating (0 – 100), health satisfaction (5-point scale, 0 = very satisfied, 4 = very dissatisfied; low scores = more satisfaction), social functioning and role functioning (from SF-36). Adjusted for age, education, pain, fatigue, sleep disturbance, depressive symptoms, self-rated lupus activity, and BILD.

RESULTS

- 125 SLE, 6135 RA, 995 OA, 254 FM, and 41 SLE+FM questionnaires from respondents ≥ age 55 were completed over 3 periods. Characteristics of each group are shown in **Table 1**.
- After adjustment, NCF scores of individuals with SLE alone and SLE +FM were significantly lower than other groups (**Table 2**). Over a quarter of the SLE group had low NCF scores; almost half of the SLE + FM had low NCF scores (**Table 2**).
- Among respondents with SLE only, low NCF scores were associated with:
 - Significantly higher self-reported disease activity and damage, and a greater occurrence of recent flares (**Table 3**).
 - Significantly worse health satisfaction, global health status ratings, social functioning, and role physical function, even after adjusting for symptoms and lupus status variables (**Table 4**).

CONCLUSION

- Cognitive symptoms are significantly worse among older individuals with SLE compared to individuals of similar age with other rheumatic or musculoskeletal conditions.
- Worse perceived cognitive function is, in turn, associated with worse self-reported disease status.
- Worse perceived cognitive function was also associated with worse social and role functioning and perceptions of overall health, even after controlling for lupus disease status.
- The burden of cognitive symptoms continues into older age for individuals with SLE, is significantly greater than for older individuals with other rheumatic/musculoskeletal conditions, and has an important impact on quality of life, above and beyond lupus disease status.

For older individuals with SLE, the burden of cognitive symptoms: is significantly greater than for people with other rheumatic/musculoskeletal conditions.

➤ has an important impact on quality of life, above and beyond lupus disease status.

Table 1. Sample characteristics by diagnosis group

	SLE	RA	OA	FM	SLE + FM	p*
N observations	125	6135	995	254	41	
Age, years	72 ± 8	72 ± 8	75 ± 8	72 ± 8	65 ± 6	<0.0001
Female, %	90	83	83	93	100	<0.0001
Comorbidity Index	2.3 ± 1.8	2.0 ± 1.6	2.0 ± 1.6	2.6 ± 1.6	3.7 ± 1.8	<0.0001
BMI	28 ± 8	28 ± 7	29 ± 7	31 ± 7	28 ± 13	<0.0001
SLE duration, years	31 ± 10	27 ± 8	26 ± 12	30 ± 14	30 ± 13	0.11
Current glucocorticoid use, %	40	20	6	9	37	<0.0001
Fatigue rating (0 – 10)	3.9 ± 3.0	3.9 ± 3.0	4.2 ± 3.0	5.5 ± 2.8	5.8 ± 3.1	<0.0001
Pain rating (0 – 10)	3.5 ± 2.8	3.4 ± 2.6	3.8 ± 2.6	5.3 ± 2.7	5.0 ± 3.3	<0.0001
Sleep problem (0 – 10)	3.3 ± 3.2	3.4 ± 2.9	3.6 ± 3.0	4.5 ± 3.0	4.1 ± 3.4	0.0007
HAQ II	0.94 ± 0.76	0.81 ± 0.62	0.78 ± 0.52	1.17 ± 0.65	1.11 ± 0.88	0.0014
Depression (PHQ8)	4.7 ± 4.0	4.1 ± 4.1	3.4 ± 3.3	7.3 ± 5.5	8.5 ± 5.7	<0.0001

Tabled values are mean ± SD unless otherwise noted.

*p-value from analysis of variance or chi-square analyses

SLE = systemic lupus erythematosus; RA = rheumatoid arthritis; OA = osteoarthritis; FM = fibromyalgia

Table 2. NeuroQoL scores by diagnosis group

	SLE	RA	OA	FM	SLE + FM	p*
NeuroQoL T-score†	43.6	51.8	52.4	46.7	41.9	<0.0001
% with low NeuroQoL‡	30.8	9.3	5.6	25.6	46.2	<0.0001

† adjusted means from GEE analysis

*p-value from generalized estimating equation (GEE) analysis, adjusting for age, SLE duration, prednisone use, fatigue, pain, sleep, and depression

‡ low defined as NeuroQoL T-score ≤40 (1 std dev below population mean)

Table 3. Self-rated lupus disease status for SLE participants with and without low NeuroQoL T-scores

	Low NeuroQoL			Adjusted*	
	No	Yes	P	β (95% CI)	p
Lupus disease activity (0 – 10)	2.5 ± 2.5	3.5 ± 3.1	0.0002	0.2 (-0.3, 0.6)	0.79
Self-reported disease damage (Brief Index of Lupus Damage, BILD)	3.6 ± 1.9	4.4 ± 2.2	0.0007	0.6 (0.2, 1.0)	0.003
				OR (95% CI)	p
Flare in past 3 months	37.1%	53.4%	0.001	1.8 (1.1, 3.1)	0.03

* From multiple regression analyses controlling for age, disease duration, pain, fatigue, and sleep.

Table 4. Self-rated general health status, health satisfaction, social and role functioning for SLE participants with and without low NeuroQoL T-scores

	Low NeuroQoL			Adjusted*	
	No	Yes	P	β (95% CI)	p
Global impact of disease (0 – 10) ¹	3.3 ± 2.4	4.4 ± 2.6	<0.0001	0.4 (0.03, 0.8)	0.03
Health satisfaction (0 – 5) ¹	1.7 ± 1.2	2.2 ± 1.2	<0.0001	0.2 (-0.05, 0.4)	0.14
SF36 Role Physical ²	41.7 ± 12.4	34.7 ± 9.8	<0.0001	-3.4 (-5.5, -1.3)	0.0016
SF36 Social Function ²	45.7 ± 10.5	37.7 ± 12.1	<0.0001	-4.1 (-6.1, -2.1)	<0.0001

• From multiple regression analyses controlling for age, disease duration, pain, fatigue, sleep, disease damage (BILD), and lupus disease activity rating.

¹ higher scores are worse

² lower scores are worse

REFERENCES

- ¹Iverson GL et al. Arch Clin Neuropsychol 2021; 36:126-134.