RESEARCH LETTER

Clinical manifestations of neuropsychiatric systemic lupus erythematosus: a single-center study from West Pomerania Province in Poland

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Introduction Systemic lupus erythematosus (SLE) is an autoimmune disease, causing systemic inflammation and organ failure through loss of tolerance to autoantigens and the formation and accumulation of immune complexes in tissues and organs. The prevalence of SLE varies depending on a geographic area.[1] Neuropsychiatric systemic lupus erythematosus (NPSLE) currently is a poorly understood manifestation of SLE that is associated with high mortality.[2] It may occur regardless of SLE activity and without serological activity.[3] There are large discrepancies in the available literature regarding the prevalence of NPSLE, ranging from 14% to over 80% in adults.[4] Almost 20 years ago, the American College of Rheumatology defined 19 neurological syndromes covering both the central and peripheral nervous system on the basis of which the neuropsychiatric form of SLE is diagnosed to this day. The central nervous system syndromes include aseptic meningitis, cerebrovascular disease, demyelinating syndrome, headache, movement disorder, myelopathy, seizures, acute confusional state, anxiety disorder, cognitive dysfunction, mood disorder, and psychosis. The peripheral nervous system syndromes include cranial neuropathy, acute inflammatory demyelinating polyradiculoneuropathy, autonomic disorder, single or multiple mononeuropathy, myasthenia gravis, plexopathy, and polyneuropathy.[5] However, neurological syndromes may overlap in the same patient or completely new syndromes that are not included in the American College of Rheumatology classification may appear.[6] Despite numerous studies in this field, the actual prevalence of NPSLE in the SLE population, as well as the reported prevalence of specific NPSLE-defining symptoms, are still unclear. Given this and the lack of data on the prevalence of neuropsychiatric symptoms in the Polish population, the aim of this study was to investigate the configuration of neuropsychiatric symptoms in patients with NPSLE.

Patients and methods The study involved 154 adult patients diagnosed with NPSLE,[5] hospitalized at the Department of Rheumatology of Pomeranian Medical University in Szczecin, Poland. The control group consisted of 133 additional post-traumatic patients with multiple traumas but without evidence of central nervous system injury, hospitalized at the Emergency Department of the Public Hospital no. 1 in Szczecin who had neither SLE nor NPSLE. Data concerning neuropsychiatric symptoms[5] were collected from all patients. Data were collected using a binary system: 0, no symptom; 1, symptom present. The study was approved by the bioethics committee of the Pomeranian Medical University in Szczecin (KB-0012/120/04/19).

Statistical analysis In order to compare characteristics of patients with NPSLE with controls, the Fisher exact test (qualitative data) and the Mann–Whitney test (quantitative data) were applied. In addition, univariable and multivariable logistic regression models were calculated for assessing the odds ratio of selected risk factors of NPSLE incidence among patients with NPSLE and controls. A *P* value of less than 0.05 was considered to indicate significance. All calculations were performed in the R statistical environment (R Version 3.4.4 2018-03-15; The R Foundation, Vienna, Austria).

Results and discussion Based on univariable and multivariable logistic regression models, it was observed that in the group of patients with NPSLE compared with controls, more subjects experienced headache, cognitive impairment, depression, a cerebrovascular event, and seizures (TABLE 1).

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TABLE 1 Analysis of risk factors of neuropsychiatric systemic lupus erythematosus (NPSLE)

Factors		Status[a]		Univariable logistic regression models		Multivariable logistic regression model[b]	
		NPSLE (n = 154), n (%)	Controls (n = 133), n (%)	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Age		–	–	0.98 (0.96–1.01)	0.16	1 (0.97–1.03)	0.95
Sex	Male	10 (6.5)	8 (6)	1.09 (0.42–2.92)	0.87	0.66 (0.19–2.38)	0.52
	Female	144 (93.5)	125 (94)	1.0 (–)	–	1.0 (–)	–
Headache	Yes	134 (87)	39 (29)	16.15 (9.03–30.09)	<0.001	11.53 (5.69–24.86)	<0.001
	No	20 (13)	94 (71)	1.0 (–)	–	1.0 (–)	–
Cognitive impairment	Yes	86 (56)	19 (14)	7.59 (4.32–13.87)	<0.001	3.06 (1.35–7.05)	0.01
	No	68 (44)	114 (86)	1.0 (–)	–	1.0 (–)	–
Depression	Yes	97 (63)	18 (13.5)	10.87 (6.12–20.2)	<0.001	3.43 (1.56–7.64)	<0.001
	No	57 (37)	115 (86.5)	1.0 (–)	–	1.0 (–)	–
Cerebrovascular event	Yes	39 (25)	6 (4.5)	7.18 (3.14–19.43)	<0.001	9.75 (3–36.06)	<0.001
	No	115 (75)	127 (95.5)	1.0 (–)	–	1.0 (–)	–
Seizures	Yes	21 (13.6)	3 (2.3)	6.84 (2.29–29.46)	<0.001	12.57 (2.63–73.44)	<0.001
	No	133 (86.4)	130 (97.7)	1.0 (–)	–	1.0 (–)	–

a Status: 1 means with NPSLE; 0 means controls

b Full adjusted model; independent variables: age (quantitative); sex (female/male); headache (yes/no); cognitive impairment (yes/no); depression (yes/no); cerebrovascular event (yes/no); seizures (yes/no)

Our analysis showed that the odds ratio of NPSLE is particularly high in individuals with: headache, cognitive impairment, depression, a cerebrovascular event, and seizures.

Headache is an extremely common condition in the general population. It is also one of the most frequently reported complaints by patients with SLE. However, several studies have not confirmed that the incidence of headache in patients with SLE is higher than in the general population. In our analysis, headache was the most common neurological manifestation reported by patients with NPSLE, which is consistent with other studies.[7,8]

The prevalence of cerebrovascular events in patients with NPSLE in our study was higher than in the previous studies.[9,10] This may be due to our binary data collection system, which did not take into account the division of cerebrovascular events into ischemic, hemorrhagic, and venous arterial incidents (some studies allow for just one category of these incidents).

Cognitive assessment of patients with SLE may vary over time. Changes in cognitive function may be temporary and not clearly related to the activity of SLE. Assessment of cognitive function in individuals with SLE requires careful clinical judgement, in which consideration should also be given to other factors and disorders, such as depression, that may be triggering or exacerbating cognitive disorders. In our study, the prevalence of cognitive impairment in patients with NPSLE was similar to the results of other studies.[11,12]

Patients with SLE may also suffer from seizures. These are usually generalized, although sometimes focal seizures may also be present. In our analysis, 13.6% of patients with NPSLE had epilepsy, which is in the range of the reported prevalence of epilepsy in patients with SLE in other studies.[9,10]

Depression is a common disease in the general population. However, it is more frequently observed in patients with chronic diseases. Approximately 15% of patients with SLE exhibit depressive disorders. This is confirmed by our study, in which depression was the second most prevalent NPSLE symptom after headaches.

Our study was subject to certain limitations, which must be taken into account. This was a single-center retrospective study with a limited number of patients with NPSLE and no controls with SLE but free of NPSLE. We selected only the most common NPSLE symptoms. Further prospective studies with a larger sample size are needed.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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REFERENCES

1 Stojan G, Petri M. Epidemiology of systemic lupus erythematosus: an update. Curr Opin Rheumatol. 2018; 30: 144-150.

2 Hanly JG, Urowitz MB, Sanchez-Guerrero J, et al. Neuropsychiatric events at the time of diagnosis of systemic lupus erythematosus: an international inception cohort study. Arthritis Rheum. 2007; 56: 265-273.

3 Sabbadini MG, Manfredi AA, Bozzolo E, et al. Central nervous system involvement in systemic lupus erythematosus patients without overt neuropsychiatric manifestations. Lupus. 1999; 8: 11-19.

4 Zhu TY, Tam LS, Lee VW, et al. Systemic lupus erythematosus with neuropsychiatric manifestation incurs high disease costs: a cost-of-illness study in Hong Kong. Rheumatology (Oxford). 2009; 48: 564-568.

5 The American College of Rheumatology nomenclature and case definitions for neuropsychiatric lupus syndromes. Arthritis Rheum. 1999; 42: 599-608.

6 Wańkowicz P, Nowacki P, Brzosko M, Bobrowska-Snarska D. An overlapping case of Bickerstaff brainstem encephalitis and acute motor axonal neuropathy variant of Guillain-Barré syndrome associated with systemic lupus erythematosus. Pol Arch Intern Med. 2019; 129: 50-51.

7 Hanly JG, Urowitz MB, O'Keeffe AG, et al. Headache in systemic lupus erythematosus: results from a prospective, international inception cohort study. Arthritis Rheum. 2013; 65: 2887-2897.

8 Brey RL, Holliday SL, Saklad AR, et al. Neuropsychiatric syndromes in lupus: prevalence using standardized definitions. Neurology. 2002; 58: 1214-1220.

9 Sanna G, Bertolaccini ML, Cuadrado MJ, et al. Neuropsychiatric manifestations in systemic lupus erythematosus: Prevalence and association with antiphospholipid antibodies. J Rheumatol. 2003; 30: 985-992.

10 Robert M, Sunitha R, Thulaseedharan NK. Neuropsychiatric manifestations systemic lupus erythematosus: a study from South India. Neurol India. 2006; 54: 75-77.

11 Kakati S, Barman B, Ahmed SU, Hussain M. Neurological manifestations in systemic lupus erythematosus: a single centre study from North East India. J Clin Diagn Res. 2017; 11: OC05-OC09.

12 Tay SH, Fairhurst AM, Mak A. Clinical utility of circulating anti-N-methyl-d-aspartate receptor subunits NR2A/B antibody for the diagnosis of neuropsychiatric syndromes in systemic lupus erythematosus and Sjögren's syndrome: an updated meta-analysis. Autoimmun Rev. 2017; 16: 114-122.