Self-efficacy is associated with a lower probability of damage accrual in patients with systemic lupus erythematosus: data from the Almenara Lupus Cohort

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Abstract

Objective

To evaluate the association between self-efficacy and damage accrual in SLE patients.

Methods

We evaluated SLE patients from the Almenara Lupus Cohort. Self-efficacy was ascertained with the six instruments of the Patient-Reported Outcomes Measurement Information System® (PROMIS®) Self-efficacy for Managing Chronic Conditions. For PROMIS instruments, the higher score, the greater self-efficacy. Damage was assessed with the SLICC/ACR damage index (SDI). Generalised estimating equations were performed, using as the outcome any increase in the SDI and the self-efficacy instrument in the previous visit; multivariable models were adjusted for possible confounders measured at the same visit as the self-efficacy instrument. OR was reported per 5 units increase per self-efficacy instrument component.

Results

A total of 209 patients and 563 visits were included. At baseline, mean general self-efficacy was 47.2 (10.4), self-efficacy for managing emotions was 44.6 (8.0), for managing symptoms was 47.7 (8.2), for managing daily activities was 45.5 (7.5), for managing social interactions was 42.9 (7.9) and for managing medications and treatment was 43.9 (7.0). During the follow-up visits, 41 (19.6%) patients accrued damage once and 2 patients (1.0%) accrued it twice. In the multivariable models, a better self-efficacy for managing symptoms and daily activities were predictive of less damage accrual (OR=0.79, 95% CI=0.64–0.98 and OR=0.71, 95% CI=0.54–0.95, respectively).

Conclusion

A better self-efficacy mainly in the managing symptoms and daily activities domains is predictive of a lower risk of damage accrual, even after adjusting for possible confounders. Strategies to improve self-efficacy in SLE patients should be encouraged to improve patients' outcomes.

Key words

lupus, self-efficacy, damage

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Introduction

Systemic lupus erythematosus (SLE) is a chronic inflammatory autoimmune disease affecting a broad range of organ systems and presenting with various clinical manifestations which considerably reduce the quality of life of patients affected by it (1).

One third of SLE patients report low confidence in self-managing their illness and low activation measured by the "Patient Activation Measure" score in relation to demographic, disease-related, patient-provider communication and psychosocial variables (2). Patients, in general, need to acquire self-care knowledge and skills, and must find appropriate ways to manage their surrounding environments to maintain optimal health (3).

Self-efficacy represents people's beliefs about their capabilities to produce designated levels of performance, influencing events that affect their lives. The concept of 'self-efficacy in the management of their illness' implies the perceived capacity of working in partnership with health professionals to manage their diseases and related treatments (4).

In studies of different other diseases (*e.g.* diabetes, kidney diseases), self-efficacy has been associated with increased compliance to treatment and behavioral changes, as well as with greater physical and psychological well-being (5-7). In SLE, self-efficacy has been reported to be associated with treatment adherence and health-related quality of life (HRQoL) (8-10); therefore, self-efficacy is expected to improve mid- and long-term SLE outcomes such as damage. Thus, the objective of this study was to evaluate the association between self-efficacy and damage accrual in SLE patients.

Methods

Patients

Starting in January 2012, all SLE patients older than 18 years of age presenting to the rheumatology department of the Hospital Guillermo Almenara Irigoyen in Lima, Peru have been invited to participate in this cohort. Recruitment is currently ongoing. Patients with other autoimmune diseases, with the exception of the Sjogren's and the antiphospholipid syndromes, are excluded. This hospital's institutional review board approved this study (3474-OCID-G-RAA-ESSALUD-11, 271-CEI-CIDG-RAA-ESSALUD-13, 302-CEI-ICD-G-RAA-14, 3027-OCID-G-RAA-ESSALUD-15 and 4072-OCID-G-HNGAI-ESSALUD-2017).

Patients who signed the informed consent were evaluated with a protocol, which included an interview, medical records review, physical examination, and laboratory tests (11). For these analyses, we have included those patients with at least two visits between October 2018 and February 2020.

All patients met the 1997 Revised and Updated American College of Rheumatology criteria (12) when entering the cohort. Demographic data included were gender, age at diagnosis, socioeconomic status according to the Graffar method (13) and educational level, defined as years of formal education.

The clinical variables included were disease activity [ascertained using the SLE Disease Activity Index-2K (SLEDAI-2K)] (14) and damage accrual [ascertained using the Systemic Lupus International Collaborating Clinics/American College of Rheumatology (SLICC/ACR) Damage Index (SDI) and it was defined as the increase in SDI scores] (15).

Self-efficacy was ascertained with the five domains of the PROMIS self-efficacy (16) for managing chronic conditions instrument: managing daily activities, managing symptoms, managing medications and treatments, managing emotions and managing social interactions.

Each of the five domains of the PROMIS self-efficacy for managing chronic conditions has eight items with raw scores ranging from 8 to 40. All raw scores are converted into T-scores metrics in which 50 is the average and 10 is the SD; for a clinical population (people with a chronic condition), a higher score indicates that the respondent has greater self-efficacy, for example, a score of 60 is 1 SD higher than the mean of the reference population.

Furthermore, therapeutic variables including the use of prednisone (current dose and time of exposure) and the use

of immunosuppressive and antimalarial drugs was recorded (baseline and duration of follow-up).

Statistical analyses

Generalised estimating equations were performed, using as the outcome any increase in the SDI and the self-efficacy instrument in the previous visit; multivariable models were adjusted for possible confounders measured at the same visit as the self-efficacy instrument. OR was reported per 5 units increase per self-efficacy instrument component.

A $p<0.05$ was considered significant in all analyses. All analyses were performed using SPSS v. 28.0 (IBM, Chicago, USA).

Results

A total of 209 patients and 563 visits were included. At baseline, the mean general self-efficacy was 47.2 (10.4), self-efficacy for managing emotions was 44.6 (8.0), for managing symptoms was 47.7 (8.2), for managing daily activities was 45.5 (7.5), for managing social interactions was 42.9 (7.9) and for managing medications and treatment was 43.9 (7.0). Baseline characteristics are depicted in Table I.

The duration of follow-up was 1.4 (0.9) years. During the follow-up visits, 41 (19.6%) patients accrued damage once and 2 patients (1.0%) accrued damage twice. In the multivariable models, a better self-efficacy for managing symptoms and daily activities was predictive of less damage accrual. Univariable and multivariable models are depicted in Table II. The number of damage events per domain are depicted in Table III.

Table I. Baseline characteristics of patients from the Almenara Lupus Cohort .

Characteristics	n (%) or mean (SD)
Female gender	194 (92.8%)
Ethnicity	
Mestizo	204 (97.6%)
White	2 (1.0%)
African Latin American	3 (1.4%)
Age at diagnosis, years	36.3 (14.0)
Disease duration, years	6.5 (6.0)
SLEDAI-2K	2.2 (3.2)
Neuropsychiatric	0 (0.0)
Vasculitis	1 (0.5)
Renal	36 (17.2)
Musculoskeletal	21 (10.0)
Serositis	0 (0.0)
Skin	13 (6.2)
Fever	0 (0.0)
Haematological	10 (4.8)
Immunological	61 (29.2)
SDI	1.3 (1.5)
SDI domains	
Ocular	23 (11.0)
Neuropsychiatric	37 (17.7)
Renal	24 (11.5)
Pulmonary	21 (10.1)
Cardiovascular	6 (2.9)
Peripheral vascular	5 (2.4)
Gastrointestinal	22 (10.6)
Musculoskeletal	43 (20.6)
Mucocutaneous	3 (1.4)
Gonadal	15 (7.2)
Diabetes	11 (5.3)
Cancer	6 (2.9)
Comorbidities	
Hypertension	74 (35.4)
Diabetes*	19 (9.1)
Metabolic syndrome	67 (32.1)
Prednisone daily dose, mg/day	3.2 (3.8)
Antimalarial use	
Never	11 (5.3%)
Past	48 (23.0%)
Current	150 (71.8%)
Immunosuppressive drug use	
Never	45 (21.5%)
Past	60 (28.7%)
Current	104 (49.8%)
PROMIS Self-Efficacy	
General self-efficacy	47.2 (10.4)
Self-efficacy for managing emotions	44.6 (8.0)
Self-efficacy for managing symptoms	47.7 (8.2)
Self-efficacy for managing daily activities	45.5 (7.5)
Self-efficacy for managing social interactions	42.5 (7.9)
Self-efficacy for managing medications and treatments	43.9 (7.0)

n: number; SD: standard deviation; SLEDAI-2K: Systemic Lupus Erythematosus Disease Activity Index 2K; SDI: Systemic Lupus International Collaborating Clinics (SLICC)/ACR Damage Index; Mestizo: person of European and Native American ancestry.
*Some patients who had diabetes before the diagnosis of SLE, therefore diabetes was not included in the SDI in these patients.

Discussion

Self-efficacy is considered one of the most important factors for educational interventions aimed at enhancing SLE patients' mental health status (17). SLE patients perceive that they are lacking lupus self-management skills (2). They need additional resources to improve their ability to self-manage their disease (2). We have found that a better self-efficacy, mainly in the managing symptoms and daily activities domains, is predictive of a lower risk of damage accrual.

Few studies have investigated the relationship between self-efficacy and damage; in a cross-sectional analysis of SLE patients from North Carolina, Sun *et al*. described an inverse association between organ damage and general self-efficacy only in African American patients with SLE but not in White patients, despite similar levels of self-efficacy in both racial groups, suggest-

Table II. Predictive value of self-efficacy on damage accrual in SLE patients from the Almenara cohort.

	Univariable model		Multivariable model	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
General	0.94 (0.83-1.07)	0.347	0.91 (0.78-1.07)	0.250
Managing emotions	0.98 (0.83-1.17)	0.858	0.96 (0.78-1.18)	0.674
Managing symptoms	0.83 (0.69-1.01)	0.056	**0.79 (0.64-0.98)**	**0.032**
Managing daily activities	0.79 (0.63-1.00)	0.051	**0.72 (0.54-0.95)**	**0.021**
Managing social interactions	0.94 (0.76-1.15)	0.528	0.94 (0.73-1.20)	0.936
Managing medications and treatment[#]	0.99 (0.80-1.24)	0.952	1.04 (0.83-1.32)	0.719

SE: Standard error. *Adjusted for age at diagnosis, gender, socioeconomic status.
SLEDAI-2K: SLICC/ACR Damage Index; disease duration at baseline, prednisone daily dose, antimalarial and immunosuppressive drugs use in the previous visit. [#]Only patients taking at least one medication were included in these analyses.

Table III. Damage increase per organ/system domain.

Domain	n. of events
Ocular	4
Neuropsychiatric	8
Renal	8
Pulmonary	7
Cardiovascular	5
Peripheral vascular	5
Gastrointestinal	3
Musculoskeletal	14
Mucocutaneous	0
Gonadal	2
Diabetes	0
Cancer	3

ing that modifying self-efficacy could reduce SLE racial disparities (18).

Self-efficacy could have a protective effect in the management of the disease with a problem oriented approach, thus influencing the HRQoL of SLE patients (19).

For example, self-efficacy to manage medications and treatments was inversely related to fatigue and pain interference in African American women with SLE from Georgia (20). Moreover, Sohng *et al*. examined the effects of a SLE self-management course in Korean patients and concluded it had a favourable effect in reducing fatigue and depression and improving coping skills and self-efficacy (21). Furthermore, a lower self-efficacy was associated with persistent nonadherence (10), while adherence was associated with better SLE outcomes; for example, adherence to antimalarials was associated with a higher probability of achieving low disease activity (8) and a lower probability of flares (9).

Therefore, the importance of maintaining self-care long-term is to prevent the occurrence of future complications (2), namely damage and premature mortality. This seems to be particularly true for the self-efficacy domains related to physical activities (daily activities and managing symptoms).

In our study, we can appreciate that the SDI showed greater musculoskeletal system involvement, followed by neuropsychiatric and renal. Such findings are associated with increased mortality, increased public health costs, limitation of activities and a diminished quality of life (22). Therefore, these results influence patients' self-efficacy. Unfortunately, we could not examine the number of events per organ/system, but there could be a different impact on each one.

This research has, however, some limitations. First, as this is a prevalent cohort, we could not ascertain the impact of disease characteristics before the baseline or intake visit. Second, the relatively small sample size precluded us from making stronger conclusions. The main strength of this study is that this is one of the few cohorts to evaluate the association between self-efficacy and damage accrual in Latin America. It will be necessary to conduct longitudinal studies with larger number of patients of more diverse racial/ethnic and socioeconomic backgrounds to confirm our findings.

In conclusion, better self-efficacy, mainly in managing symptoms and daily activities domains, is predictive of a lower risk of damage accrual.

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