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Quality-of-life predictor factors in patients with SLE and their modification after cognitive behavioural therapy

N Navarrete-Navarrete¹, MI Peralta-Ramírez²,³, JM Sabio¹, I Martínez-Egea¹, A Santos-Ruiz² and J Jiménez-Alonso¹

¹Systemic Autoimmune Diseases Unit of Hospital Universitario Virgen de las Nieves, Granada, Spain; ²School of Psychology, University of Granada, Spain; and ³Institute of Neurosciences ‘Dr Lopez Neira’, University of Granada, Granada, Spain

Objective: The aim of the study was to determine the clinical and psychological factors linked to health-related quality of life (HRQOL) in patients with systemic lupus erythematosus (SLE) and test the effectiveness of cognitive behavioural therapy in changing these factors.

Methods: We evaluated 34 patients with SLE over a period of 15 months. In order to study the variables related to items of QOL and the physical (PCS) and mental (MCS) component summaries of the SF-36, several multiple linear regression models were constructed. Patients were randomized and distributed into two similar groups; one of them received cognitive behavioural therapy and the other received the usual controlled care. The psychological aspects as well as the related-disease factors were evaluated four times during the study.

Results: Self-perceived stress ($R^2$ corrected: 0.314, $t$: −2.476, $p < 0.021$), vulnerability to stress ($R^2$ corrected: 0.448, $T$: −2.166, $p < 0.04$) and anxiety ($R^2$ corrected: 0.689, $T$: −7.294, $p < 0.00$) were predictor variables of MCS. The group of patients who received the therapy improved their level of physical role functioning, vitality, general health perceptions and mental health, compared with the group of patients who only received conventional care.

Conclusion: QOL usually depends on multiple factors, some of which are stress and anxiety, which can be modified by a cognitive behavioural therapy, in order to obtain a significant improvement in the HRQOL, irrespective of the activity level of the disease. Frequent evaluations of the quality of life in patients with SLE and psychological treatment should also be considered. Lupus (2010) 19, 1632–1639.

Key words: cognitive behavioural therapy; mental component summary (MCS); physical component summary (PCS); quality of life; SF-36

Introduction

The World Health Organization (WHO) has defined quality of life (QOL) as ‘individuals’ perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns’.¹ It is a concept affected not only by a person’s physical health but also by his/her psychological state, social relationships and personal beliefs. QOL evaluations consider the effects of the disease or its treatment from the patient’s perspective and determine the need for social, emotional and physical support during illness. Although some studies suggest that disease activity correlates with QOL,²,³ others have shown that QOL in systemic lupus erythematosus (SLE) patients does not correlate with the disease status,⁴–⁶ and, therefore, QOL is often unrelated to the activity indicators of the disease. It has been shown that psychosocial factors (stress, learned helplessness and social support among others), disease, and therapy-related factors all have an influence on QOL in patients with SLE.²,⁴,⁶ SLE Disease Activity Index (SLEDAI) and Systemic Lupus International Collaborating Clinics (SLICC) do not quantify the social impact of the disease or measure the functioning and well being from the patients’ perspective, so they are poor indicators of health-related QOL (HRQOL) in patients with SLE.⁷ For this reason, some academics suggest that QOL in patients with SLE should be measured often. At the same time, the disease activity and physical damage caused should also be evaluated given that these are three
complementary aspects that together can give an indication of the effectiveness of treatment. The broader scope of questions, widespread use, and international validation of the SF-36 makes it the preferred instrument for measuring QOL in patients with SLE. Levels of daily stress among patients with SLE are generally higher than those experienced by the general population. Such stress is closely linked to symptoms of depression and anxiety and the worsening of lupus symptoms. The objective of this study is to describe which aspects of the QOL were most affected in patients with SLE, to test which physical and psychological variables are predictive of this, and to assess whether cognitive behavioural therapy aimed at modifying daily stress and other emotional variables can improve the QOL in patients with SLE.

Materials and methods

A randomized linear study with a control group was carried out over a period of 15 months.

Study population

Thirty-five patients participated in the study. All of the patients met at least four of the American College of Rheumatology (ACR) criteria in order to be classified as suffering from SLE. The participants were patients at our Systemic Autoimmune Disease Unit. They all had at least a basic level of literacy and none of them presented any associated major mental illnesses at the time of the study. All of these patients gave their signed informed consent to participate in this study.

Information collected

Demographic data

Demographic data included age, gender, educational level, years since the diagnosis of the disease, age at the diagnosis of the disease.

SLE-related factors

Lupus activity was measured by the SLEDAI, which comprises 24 descriptors with pre-assigned severity weights. The total SLEDAI score can range from 0 (no activity) to 105 (maximum activity). The SLICC/ACR damage index was used to assess accumulated damage since the onset of the disease. Anti-dsDNA antibodies, and serum complements C3 and C4 were analysed. The incidence of relapse in the previous year was collected from the clinical histories of the patients.

Psychological variables

The Cohen Perceived Stress Questionnaire measures the degree to which situations in one’s life are appraised as stressful. Items were designed to determine how unpredictable, uncontrollable and overloaded respondents found their lives. This scale assesses the amount of stress in one’s life rather than the response to a specific stressor. The version used was made up of 10 items.

The Perceived Stress Scale (SRLE) reports on the number of daily stressful events and the degree of stress produced by each of them in the past month, based on a scale which ranges between 1 (‘has not been part of my life at all’) and 4 (‘has been part of my life in a very intense way’).

The Stress Vulnerability Inventory evaluates how vulnerable the subject is to the effects of stress.
The State–Trait Anxiety Inventory (STAI)\textsuperscript{17} contains two separate self-evaluation scales that measure two independent concepts of anxiety, state (S) and trait (T). It has proven to be useful for measuring the two types of anxiety in patients belonging to diverse clinical groups.

The Beck Depression Inventory (BDI)\textsuperscript{18} is a self-applied questionnaire that contains 21 items that include the cognitive components of depression to a greater degree than the behavioural and somatic scales. It provides a measure of the depth of the depression in patients with any diagnosis. The scores on this instrument can be classified into: (10) no depression, (18) mild depression, (25) moderate depression and (30) severe depression.

Quality of Life
The Short Form 36-item Health Survey Questionnaire (SF-36)\textsuperscript{19} is an instrument that includes 36 items which provide information on eight different areas of health (physical function, level of physical role functioning, bodily pain, general health perceptions, vitality, social function, emotional role and mental health). It also allows us to summarize the results in two crucial areas: physical (PCS) and psychological (MCS). The scores can range from 0 to 100 and are directly proportional to the state of health; therefore, a higher score means better QOL.

Procedure
The patients were recruited by the internists at the outpatient clinic for autoimmune diseases. They invited all 200 lupus patients in our unit (by means of a letter, a telephone call or in their routine medical check-up) to participate in the study, and 50 of them agreed to take part and attend a meeting where they were informed about the QOL and emotional states in lupus patients, as well as the proposed study objectives. Of the 50 people who attended the information meeting, 15 were rejected for different reasons (pregnancy, chronic cutaneous lupus, lack of availability in their schedules, low academic level). Thirty-four lupus patients gave their signed informed consent to participate in this study.

First, levels of depression, anxiety and stress were assessed for all of the patients, using the instruments already described.

Patients were randomized to the therapy group (TG; $n = 18$) and control group (CG; $n = 16$). The patients assigned to the TG received 10 consecutive weekly sessions lasting 2 h each. After 9 and 12 months, two booster sessions were held with the goal of reinforcing the skills acquired in dealing with stress. The therapy sessions\textsuperscript{20} dealt with the following:

5. Alternative thought control strategies: Self-instructional training and thought stopping.
7. An approach to controlling pain oneself.
8. Training in social skills: Assertiveness techniques and basic assertive rights.
9. Training in social skills: How to say no without feeling bad, asking another person to change their behaviour.
10. Humour and optimism as coping strategies.

The group that received conventional care only received general advice about getting enough rest at night, doing moderate exercise, eating a balanced diet, etc. The QOL was evaluated over a period of 15 months at different points during the study: at the beginning, at the end of the treatment, at 9 months and again at 15 months.

Statistical analyses
First of all, the average point scores of all of the patients in each of the different areas of QOL were put into a table in order to describe the QOL for the population studied. Then, we carried out various multiple regression analyses using the step-wise method with the aim of testing which variables best explain the QOL scores. The dependent variables were the scores on each of the scales: general physical and mental health. The independent variables were the scores on the inventories for depression, anxiety, stress, SLEDAI and incidence of physical symptoms. Finally, eight mixed-model, repeated measure analyses of variance (ANOVAs) were carried out in order to test the effectiveness of the cognitive behavioural therapy based on the general linear model. In the variables that presented a significant interaction, an ANOVA was used to verify whether there were differences between the two groups at each of the different points, with the independent variable being the group with two levels (control group and therapy group), and the dependent variable being each of the psychological, clinical and QOL measures. Bonferroni ‘post hoc’
multiple comparison analyses were carried out in order to analyse the intra-subject measures. All of the data were distributed normally. The level of statistical significance was 0.05. Calculations were performed with the Statistical Package for Social Sciences (SPSS), version 15.

Results

Characteristics of the subjects studied and quality of life

Thirty-two of the thirty-four patients were women, and two were men. This proportion is approximately the same as the female/male proportion in lupus (1/9). Moreover, one man was placed in each of the groups (one in TG and the other in CG), in order to avoid gender bias. Patients in the two groups were similar from an epidemiological and psychological point of view and also in terms of incidence of flares of the disease and SLEDAI at the beginning of the study (Table 1). Patients had a below average score in comparison to the general population on some areas of the QOL questionnaire (bodily pain, general health perceptions, vitality) and on general mental and physical health at the beginning of the study.

QOL predictor variables in patients with SLE

Psychological variables

The regression analyses showed that a vulnerability to stress and self-perceived stress were predictors of MCS; therefore, higher scores on both stress variables indicated decreased psychological well-being. However, these variables were not linked to PCS (Table 2).

With regard to the emotional variables, anxiety and depression, the results showed that anxiety acts as a predictor variable of MCS but not of PCS. Depression is not a predictor variable in either of the two QOL areas.

SLE-related factors

Finally, with regard to the physical variables, SLEDAI and the associated symptoms, neither somatic symptoms nor the level of disease activity were found to be predictor variables of MCS or PCS.

Effects on the quality of life

It is clear from Table 2 that the two groups of patients were equal according to all of the QOL subscales at the beginning of the study. Repeated ANOVA measures revealed significant time × group interactions in the following QOL...
items: physical role functioning \(F = (1.20) = 0.592; p < 0.041\), social function \(F = (1.20) = 1.784; p < 0.032\), bodily pain \(F = (1.20) = 0.016; p < 0.025\), and mental health \(F = (1.19) = 0.915; p < 0.004\), and the results were almost significant for general health perceptions \(F = (1.19) = 2.025; p < 0.096\) and vitality \(F = (1.19) = 0.55; p < 0.113\). There were no differences in the progress of physical function in the two groups that could be attributed to treatment \(F = (1.20) = 0.259; p < 0.990\) or in emotional role functioning \(F = (1.20) = 0.272; p < 0.286\). The general MCS improved significantly in the group of patients that was treated compared with those who received conventional care \(F = (1.19) = 0.627; p < 0.035\), whereas the PCS showed some improvement, although it was not statistically significant \(F = (1.19) = 0.434; p < 0.078\) (Figure 1).

The between-groups analysis showed different changes in the variables as a result of the therapy as the patients in both groups progressed. With regard to physical role functioning, differences were greater at the end of the study and after 15 months. Mental health improved significantly in the TG with respect to the CG after the therapy and at 15 months. The intrasubject analysis showed a significant improvement in TG patients in relation to social function, pain and vitality at the end of the treatment when compared with the results from the beginning of the study. Moreover, general health perceptions improved at 9 and 15 months, and mental health improved throughout the whole study when compared with the values obtained at the beginning of the study. With regard to general components, the MSC of the TG increased significantly at 3 and 15 months. Patients who received conventional care did not experience a significant improvement in any of the QOL variables analysed. The results of this analysis can be found in Table 3. The size effects estimated for each of the variables analysed are shown. A value equal to or greater than 0.5 indicates a clinically significant improvement.

### Discussion

When dealing with lupus patients in general, it may be useful to evaluate the sufferer’s own perceived QOL since this often differs from what is observed by physicians. We have demonstrated that the QOL values of patients with SLE are below those of the general population in the different areas of the SF-36 questionnaire, in accordance with other studies. 6,7,22 We also know that SLE patients suffer more from daily stress than the general population and, moreover, that stress is linked to the

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<td>0.068</td>
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<td>0.473</td>
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TG, therapy group; CG, control group; MCS, mental component summary; PCS, physical component summary.

* *p < 0.05 in the between-groups analysis.

* *p < 0.02 in the between-groups analysis.

† *p < 0.05 in the intrasubjects analysis.

‡ *p < 0.02 in the intrasubjects analysis.
aggravation of lupus symptoms.\(^9\) Our objective was to investigate the causal relationship between the different physical and psychological variables and the QOL of patients with lupus and high levels of daily stress. We have found that stress, vulnerability to stress and anxiety are predictor factors of deteriorated mental function in this group of patients. Anxiety is one of the most common neuropsychiatric symptoms in people suffering from SLE, and it has already been linked to poorer QOL in other studies.\(^2,23\) Recently, Tam et al.\(^24\) demonstrated that depression and anxiety were independent variables that affected physical and mental function in patients with SLE. However, neither daily stress nor vulnerability to stress has been independently linked to deterioration in QOL until now. Given that stress and anxiety are modifiable variables, we believe in the importance of finding an effective therapeutic solution that will improve their management in patients with SLE. However, there are very few studies on the treatment of the psychosocial factors\(^25–30\) in general, and more specifically stress,\(^31\) that affect these patients. Patients with SLE generally have fewer coping strategies than the general population, and these strategies are usually less effective.\(^32\) Therefore, we introduced cognitive behavioural therapy\(^20\) with the key aim of improving how patients deal with stress and the neuropsychiatric symptoms associated with it, such as anxiety and depression. We found that the patients who received this therapy, whose QOL was lower on average than that of the general population at the beginning of the study, reached above average levels in physical role functioning, social function, vitality, mental health and general health perceptions. All in all, as a result of the improvement in the patient’s functional and mental areas, physical and emotional problems had less impact on the patient’s social life. The patients felt more confident about the future, they felt they were less likely to relapse, their mental health improved, and they experienced greater vitality and less pain. The effect of the therapy on these areas was significant, as indicated by the medium and large effect sizes found. However, patients who received conventional care did not show any change in any of the variables analysed during the entire period of the study.

On the other hand, our results show that the level of activity of the disease is not a predictor factor of the QOL of patients with lupus. Although these results might intuitively seem strange, as we initially assume that the physical impact is responsible for the QOL of these patients, various cross-sectional\(^33–38\) and longitudinal studies\(^39–43\) have found the same results, even showing the existence of other variables that are more highly predictive of QOL, such as the cultural level or the duration of the disease\(^40\) or learned helplessness and family support.\(^44\) In any case, it is important not to underestimate the involvement of the disease activity evaluation instrument used in this study in the results obtained, as after reviewing various studies we found that there were minor differences depending on the disease activity measure used. Thus, the SLEDAI was the least likely to be correlated to QOL, and this may be due to the fact that it only contains objective items, while the BIGLAG and the SLAM include some subjective items, so the patients’ views are inevitably taken into account. Another factor could be the time frame of the measures; the BIGLAG and SLAM relate to the same time frame as the SF-36, which is 4 weeks, while the SLEDAI measures activity during the last 10 days.

Finally, it should be noted that our results support the statement by McElhone et al.\(^8\) proposing that QOL is a different entity from disease activity and damage. Therefore, all three aspects should be measured in a patient with SLE in order to obtain the complete clinical picture. On the basis of the population of this study, the results found can generally be applied to patients with SLE and high levels of daily stress. However, this study is limited in some respects. For example, the size of the sample population was small, which is common in prospective studies carried out on SLE patients. Despite this limitation, therapeutic intervention should be proposed to reduce stress and anxiety, improve QOL, and possibly moderate the evolution of the disease. We have not considered the economic factors or patients who suffer from other concomitant diseases that may have an impact on the QOL. Furthermore, it is important to highlight that it would have been interesting to include a third group to work with on areas of health education or counselling, in order to find out whether more simple therapeutic approaches might also be effective and require fewer personal resources in improving the QOL of patients with lupus.

We can, therefore, conclude that SLE patients would benefit from a more generalized approach, which would not only take physical aspects into consideration but also psychological aspects, which often, irrespective of disease activity, prolong the feeling of being ill and not making progress despite receiving the correct treatment.\(^45\) Measuring the QOL, which is determined by
physical as well as emotional aspects, is important when it comes to monitoring patients with SLE. The effective treatment of daily stress and anxiety, predictor factors of a deteriorated QOL, can be linked to a significant improvement in patient QOL.

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References


