

Relationship between Symptoms and Quality of Life in a Sarcoidosis Population

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Key Words

Breathlessness · Dyspnea · Fatigue · Quality of life · Sarcoidosis · Symptoms

Abstract

Background: As sarcoidosis is a multisystemic disorder, patients may suffer from various symptoms. The relationship between frequently reported symptoms and quality of life (QOL) has not yet been studied. **Objectives:** The aim of the present cross-sectional study was to examine the predictive value of the most frequently reported subjective symptoms on QOL after controlling for demographic variables and clinical parameters. **Methods:** A cross-sectional study was conducted at an outpatient pulmonary clinic in Zagreb, Croatia. One hundred and fifty outpatients with sarcoidosis were seen between January 2002 and May 2004. Symptoms were assessed with a symptom inventory questionnaire, and QOL was measured using the World Health Organization Quality of Life Assessment Instrument. Clinical parameters were derived from the patients' medical files. Regression analyses were performed to examine the predictive value of symptoms on QOL. **Results:** The four most frequently mentioned symptoms were fatigue, breathlessness, re-

duced exercise capacity and arthralgia. In various combinations, being female, using corticosteroids and fatigue predicted the QOL domains physical and psychological health as well as level of independence. **Conclusions:** Fatigue appeared to be the most important symptom in predicting various QOL domains after controlling for demographics, disease stage and clinical parameters. Therefore, considering improvement in the patients' QOL, it is recommended to focus not only on objective health parameters, but also on fatigue in the management of sarcoidosis.

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Introduction

The origin of sarcoidosis, a disorder characterized by noncaseating granuloma, is unknown. The most frequently affected organs are the lungs and the lymph nodes, but other organs can also be involved. Sarcoidosis patients report pain, reduced exercise capacity, skin problems and breathlessness, but fatigue is a major problem of symptomatic patients as well as of patients who do not spontaneously recall suffering from fatigue [1–4].

Quality of life (QOL) has become an important topic in chronic disease management [5]. In a sarcoidosis study, QOL was impaired regarding physical health, level of independence and overall QOL compared to healthy controls [6]. In another study, sarcoidosis patients had an inferior score in the QOL domain physical health compared with healthy controls [3]. Furthermore, a study by Cox et al. [7] demonstrated an impaired health status. Patients using oral corticosteroids experienced an even worse health-related QOL [7]. Moreover, spirometry data and total sarcoidosis organ burden were not related to the general or disease-specific health-related QOL score [7]. Medical factors, such as pulmonary function, serum angiotensin-converting enzyme level [3, 8] or time since diagnosis could not explain suboptimal QOL [8].

A majority of the members of the Dutch Sarcoidosis Society without co-morbidity (72.4%) reported pain [4]. They experienced arthralgia most frequently, followed by muscle pain, headache and chest pain. In patients with various pain problems, impaired QOL was more significant. In addition, the total amount of pain categories experienced was associated with the level of independence and energy and fatigue.

Fatigue is a major problem in sarcoidosis, and its negative association with QOL is well known. The relationship between other frequently mentioned symptoms and QOL is less well established. In the present cross-sectional study, we investigated the predictive value of the four most frequently mentioned symptoms on QOL.

Patients and Methods

Study Design

One hundred and fifty consecutive patients treated at the Klinika za plucne bolesti Jordanovac (Zagreb, Croatia) participated in this study. The diagnosis of sarcoidosis was based on consistent clinical features together with biopsy-proven noncaseating epithelioid cell granulomas, according to the international guidelines [9]. The mean age was 44.3 years, and the majority were female (table 1). Data concerning clinical parameters were derived from the patients' medical files. The study protocol was approved by the Institutional Internal Review Board, and all patients signed informed consent.

Methods

Independent Variables

Lung Function Testing. Lung function measurements, including forced expiratory volume in 1 s and forced vital capacity, were measured with a pneumotachograph. The diffusing capacity for carbon monoxide was measured by the single-breath method (both Masterlab, Jaeger, Würzburg, Germany). Values were expressed as a percentage of those predicted.

Chest Radiographs. Chest radiographs were graded according to the radiographic staging of DeRemee (0–III), adding stage IV, the end stage of lung fibrosis. Two groups were distinguished: one group included stages 0 and I and the second group stages II–IV.

Symptoms. The symptom inventory questionnaire consisted of 43 items, including questions concerning current symptoms, e.g. chest pain, arthralgia and fatigue. The questionnaire was used in several previous studies [4, 10].

Dependent Variable

QOL. The WHOQOL-100 is a generic QOL measure that consists of a general evaluative facet and six domains [11]. The reliability and validity of the instrument, which have also been tested in groups of Dutch individuals with sarcoidosis, are good [11, 12]. The psychometric qualities of the WHOQOL-100 in a Croatian diabetic sample are adequate [13].

Analysis

Discrete variables were compared with the χ^2 test and continuous variables with Student's t test for independent variables. To maintain the power of the regression analyses, univariate analyses were performed first. Only variables that were significantly related to the separate QOL domains were entered into the analyses. After controlling for demographic and medical variables, the four separate main symptoms were subjected to regression analysis on the six QOL domains and the General Facet. SPSS 11.5 was used to perform the statistical analyses.

Results

The demographic and medical characteristics of the sample are summarized in table 1. Fatigue was the most common complaint ($n = 88$, 59.5%), followed by breathlessness ($n = 70$, 48.3%) and reduced exercise capacity ($n = 68$, 45.9%; table 2). With respect to pain, arthralgia appeared to be the most common ($n = 55$, 37%). No difference was found between male and female patients regarding the experience of fatigue ($\chi^2 = 0.31$, $p = 0.58$). In patients using corticosteroids, the incidence of fatigue was not increased compared to their counterparts ($\chi^2 = 2.80$, $p = 0.07$), but a more severe radiographic disease stage was noted ($\chi^2 = 11.59$, $p = 0.01$).

The regression analyses on QOL showed that various combinations of demographic and medical variables as well as symptoms predicted QOL (table 3). Frequent negative predictors of QOL were being female and using corticosteroids. Of the four main health symptoms, fatigue was the most frequent predictor; reduced exercise capacity was never a significant predictor. The values for R^2 ranged from 0.16 (spirituality) to 0.48 (physical health).

Table 1. Demographic and medical characteristics of the Croatian sarcoidosis patients

Descriptive variables	Men	Women	Corticosteroid use		
			yes	no	
<i>Demographic data</i>					
Gender: male/female	54/96	54	96	29/45	25/51
Age, years	44.3 ± 10.1	42.0 ± 9.2	45.6 ± 10.4*	45.7 ± 10.1	43.0 ± 10.1
Partner: yes/no/missing	126/22/2	45/9/0	81/13/2	64/10	62/12/2
Education: low/middle/high/missing	31/84/30/5	4/34/14/2	27/50/16**	18/44/9	13/40/21/2
<i>Medical data</i>					
Time since diagnosis, years	3.9 ± 7.7 (median: 1)	3.6 ± 8.4	4.1 ± 7.3	5.4 ± 8.5	2.3 ± 6.4*
Smoking: never smoked/ stopped smoking (= 1 year)/smoking	117/20/13	39/8/7	78/12/6	58/10/6	59/10/7
Corticosteroid use: yes/no	76/74	29/25	45/51	74	76
<i>Lung function tests</i>					
Dlco, % of predicted	85.7 ± 15.5	85.4 ± 14.9	85.9 ± 15.9	83.6 ± 16.9	87.7 ± 13.7
FEV ₁ , % of predicted	97.0 ± 23.4	93.0 ± 21.5	98.8 ± 19.9	93.2 ± 21.5	100.3 ± 19.1*
FVC, % of predicted	98.0 ± 16.8	92.6 ± 14.6	101.0 ± 17.2**	95.6 ± 18.6	100.4 ± 14.4
Radiographic stages: 0/I/II/III/IV/ missing	23/47/46/28/1/5	6/12/26/8/0/2	17/35/20/20/1/3*	14/11/23/24/1/1	9/36/23/4/0/4*

Age, time since diagnosis and lung function parameters (except for radiographic stages) are expressed as means ± SD. Dlco = Diffusing capacity for carbon monoxide; FEV₁ = forced expiratory volume in 1 s; FVC = forced vital capacity. * p < 0.05; ** p < 0.01.

Table 2. Frequencies of symptoms

Symptoms	Total n (%)	Men n (%)	Women n (%)	Corticosteroids use, n (%)	
				yes	no
Fatigue	88 (60)	30 (56)	58 (62)	49 (66)	39 (53)
Breathlessness	70 (48)	25 (47)	45 (49)	42 (57)	28 (39)
Reduced exercise capacity	68 (46)	27 (50)	41 (44)	41 (55)	27 (37)
Arthralgia	55 (37)	16(30)	39 (42)	26 (35)	29 (39)
Skin problems	41 (28)	13 (24)	28 (30)	18 (24)	23 (31)
Chest pain	38 (26)	15 (28)	23 (25)	22 (30)	16 (22)
Muscle pain	33 (22)	9 (17)	24 (26)	20 (27)	13 (18)
Dry mouth	33 (22)	11 (20)	22 (23)	22 (30)	11 (15)
Eye problems	25 (17)	8 (15)	17 (18)	12 (16)	13 (18)
Impaired mobility	19 (13)	8 (15)	11 (12)	12 (16)	7 (10)
Headache	16 (11)	2 (4)	14 (15)	11 (15)	5 (7)
Heart problems	15 (10)	4 (7)	11 (12)	8 (11)	7 (10)
Abdominal pain	8 (5)	3 (6)	5 (5)	3 (4)	5 (7)
Starting problems	5 (3)	3 (6)	2 (2)	3 (4)	2 (3)

Discussion

The aim of this study was to study the predictive value of the four most frequently mentioned symptoms on QOL. The four most frequently reported current symptoms were fatigue, breathlessness, reduced exercise ca-

capacity and arthralgia, of which fatigue was the only complaint experienced by a majority of the Croatian sarcoidosis patients. Of the symptoms, fatigue was an important independent negative predictor of the QOL domains physical and psychological health and level of independence. Breathlessness was associated with overall QOL

Table 3. Demographic variables, medical factors and the four most frequently mentioned symptoms regressed on QOL domains and the General Facet

Variable	Overall QOL (R ² = 0.24)	Physical health (R ² = 0.48)	Psychological health (R ² = 0.43)	Level of independence (R ² = 0.43)	Social relationships (R ² = 0.21)	Environment (R ² = 0.22)	Spirituality (R ² = 0.16)
	B (SE B) β	B (SE B) β	B (SE B) β	B (SE B) β	B (SE B) β	B (SE B) β	B (SE B) β
Gender	-1.02 (0.51) -0.18*	-2.06 (0.50) -0.32***	-1.74 (0.41) -0.36***		-1.06 (0.46) -0.22**	-1.04 (0.43) -0.23*	
Having a partner			-1.34 (0.50) -0.21**	-1.85 (0.72) -0.15*			
Low education level					1.38 (0.66) 0.24*		
Using corticosteroids	-1.11 (0.47) -0.21*	-0.94 (0.46) -0.15*	-1.01 (0.38) -0.22**	-1.45 (0.53) -0.21**	-1.00 (0.42) -0.21*	-0.88 (0.40) -0.20*	
Dlco							0.04 (0.02) 0.24*
Fatigue		-2.20 (0.58) -0.35***	-0.96 (0.47) -0.20*	-1.48 (0.66) -0.21*			
Breathlessness	-1.09 (0.53) -0.21*			-1.28 (0.59) -0.19*			
Arthralgia					-0.98 (0.45) -0.21*		

Dlco = Diffusing capacity for carbon monoxide. Reduced exercise capacity was not a significant predictor of QOL and is therefore not included in the table. * p < 0.05; ** p < 0.01; *** p < 0.001.

and level of independence. Other negative predictors were being female and using corticosteroids.

Fatigue was the most frequently mentioned health complaint, confirming outcomes of earlier studies [10, 14]. The four main current symptoms corresponded to the ones reported by the members of the Dutch Sarcoidosis Society [10], although their frequency was lower in the Croatian sample. This difference can probably be explained by the recruitment method of the patients: members of a patient organization or patients of a sarcoidosis referral clinic (University Hospital of Maastricht) are expected to have more symptoms than sarcoidosis patients visiting their lung physician for a regular checkup.

Demographic and clinical variables combined with symptoms explained a relatively high percentage of the variance in the domain of physical health, psychological health and level of independence. In various combinations, fatigue, being female and, surprisingly, having a partner were negative predictors of these domains. In general, having a partner reduces mortality rates, especially for men [15]. One of the reasons for our finding

could be that women attempt to control the health of others [16]. However, not all spouses provide social support. In a study among cancer patients [17] it was described how unsupportive responses from spouses might be associated with the psychological distress of patients. In the present study, there were no demographic features that could distinguish patients with and without a partner (data not shown). Using corticosteroids was a negative predictor of the QOL domains except for spirituality and overall QOL. Whether the use of corticosteroids is a negative predictor due to the side effects is not clear, because we did not specifically ask the patients to report any side effects of the corticosteroids. ANCOVA (data not shown) showed that patients using corticosteroids reported a lower QOL after controlling for disease severity, measured by the diffusing capacity for carbon monoxide. Therefore, the association between disease severity and using corticosteroids did not account for the lower QOL in these patients. Besides using corticosteroids, being female and breathlessness predicted a lower overall QOL.

One of the limitations of this study is its cross-sectional nature. Therefore, we were not able to make inferences about causality [18]. The present study underlines the importance of paying attention to fatigue in sarcoidosis, especially because of its strong association with QOL even after controlling for medical factors and demographic factors. In the present study, fatigue is measured di-

chotomously. It is well known that this affects reliability. If future prospective studies confirm our findings, treatment of sarcoidosis patients should not only concentrate on improving clinical parameters, but also pay attention to the subjective experience of fatigue and breathlessness, since improvement of QOL is the most important issue in the treatment of these patients.

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