Original Article

Subjective sleep quality in sarcoidosis

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ABSTRACT

Background: Poor sleep is common among patients with medical disorders. Sleep disturbances can be a cause of fatigue and poor quality of life for patients suffering from sarcoidosis. Studies on subjective sleep quality or prevalence of insomnia have not been reported so far.
Objectives: The aim of this study was to investigate the subjectively reported sleep quality and its relation to psychological and physical factors in sarcoidosis patients.
Methods: 1197 patients from Germany diagnosed with sarcoidosis were examined using the Pittsburgh Sleep Quality Index (PSQI), the Medical Research Council (MRC) dyspnea scale, the Hospital Anxiety and Depression Scale (HADS) and the Multidimensional Fatigue Inventory (MFI).
Results: 802 patients (67%) had PSQI global scores >5, indicating subjectively poor quality of sleep. The mean PSQI score was 7.79 ± 4.00. Women reported a significantly inferior individual quality of sleep than men. The subjective quality of sleep was lowered significantly with increasing dyspnea for men and women. 294 patients (25%) had PSQI global scores >10 usually found in patients with clinically relevant insomnia. In this group 86% had high values for fatigue, 69% for anxiety, and 59% for depression. The prevalence of known sleep apnea was 8.7% and 15.7% for restless legs.
Conclusion: Poor subjective sleep quality in sarcoidosis patients is about twice as common as in the general population and is associated with fatigue, anxiety, depression and dyspnea. Questions about sleep complaints should therefore be included in the management of sarcoidosis.

1. Introduction

Sarcoidosis is a multisystem disease of unknown etiology, characterized by the formation of epitheloid granulomas in affected organs. Incidence rates vary with age, gender, race, and geographical location. Sarcoidosis can affect all organs, but frequently presents with respiratory symptoms such as dyspnea and persistent cough or more general symptoms such as fatigue, weight loss, fever, and night sweats [1–3]. Fatigue appears to be a frequent and characteristic feature of sarcoidosis [4,5]. Various studies have reported frequencies of 20–80% of sarcoidosis patients for fatigue [6,7]. A possible cause of fatigue can be a non-restorative sleep by sleep apnea or restless legs syndrome. These conditions have been investigated in two clinical studies with a small number of cases [8,9]. In both studies the prevalence of sleep apnea and restless legs was higher than in the normal population [10]. Chronic insomnia is the most common of all sleep disorders in the general population with a prevalence of 7.5%–30% [11,12]. Insomnia (with duration of at least one month) is defined as difficulty in initiating or maintaining sleep or non-restorative sleep

and is associated with daytime consequences such as fatigue, decreased concentration or daytime distress [13].

It is important to distinguish fatigue from sleepiness: Daytime sleepiness, that is, falling asleep in monotonous situations, is not typical for insomniac patients but for patients with sleep apnea or restless legs. It is measured by the Epworth Sleepiness Scale.

Some cross-sectional studies have shown a relationship between insomnia and medical disorders especially for cardiovascular disorders, chronic pain, and respiratory or gastrointestinal problems [14,15].

To our knowledge, studies on the subjective quality of sleep in a large group of sarcoidosis patients or on the prevalence of insomnia have not been published yet. Sleep disorders may be an important cause of fatigue and identification might offer an approach for therapy. Poor sleep is associated with higher scores for anxiety and depression and a deprived quality of life [16]. The Pittsburgh Sleep Quality Index (PSQI) has been established for the measurement of subjective sleep quality worldwide. It is used in both healthy individuals and various patient groups allowing comparison among distinct diseases.

The objectives of this study were

- to determine the prevalence of poor quality of sleep in sarcoidosis patients using the PSQI in order to compare it with findings within the general population

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- to investigate possible links between subjective quality of sleep and gender, age, fatigue, anxiety and depression
- to describe possible relationships between subjective quality of sleep and the severity of dyspnea according to the Medical Research Council (MRC) dyspnea scale
- to examine the percentage of sarcoidosis patients who would meet the clinical criteria for insomnia.

2. Methods

2.1. Sample of study population

The study was performed in collaboration with the German Sarcoidosis Society. In 2009, all members of the society (n = 4100) were asked to complete a questionnaire concerning demographic characteristics, affected organs, medication, and comorbidities. Patients were also questioned to rate dyspnea (MRC dyspnea scale), sleep quality (PSQI), anxiety and depression (Hospital Anxiety and Depression Scale: HADS) and fatigue (Multidimensional Fatigue Inventory: MFI). The questionnaire was sent out together with the community newspaper, an accompanying letter to patients, a consent form and a return envelope. The response rate was 31% (n = 1270 questionnaires). Seventy-three questionnaires were discharged because they either had names on the questionnaire (contradicting the pseudonymization procedure n = 15) or there was too little data provided (n = 58). Finally 1197 complete data sets were evaluated and pseudonymized. This study was reviewed and approved by the Ethics Committee of Leipzig University.

The sociodemographic characteristics of the patients are shown in Table 1. Approximately 80% of the patients were 41–70 years old. Women were slightly older than men. Thirty-five percent of the sarcoidosis patients had normal weight, 27% had a body mass index (BMI) of 30 or higher. Twenty percent lived without a partner, twofold among women (23.6%) compared to men (12.1%). The lungs

of most sarcoidosis patients were affected (90.7%). Other organ manifestations were skin (24.5%), lymphatic nodes (20.8%), eyes (16.0%), liver (11.8%), muscles (9.4%), nerves (9.0%), bones (8.8%), heart (7.9%), kidneys (5.0%) and others (15.9%). In 384 patients three organs or more were affected (32.1%); 45.3% of the patients were on corticosteroid therapy, 5% were treated with Azathioprine, 2.8% received Methotrexate, and 4.3% of the patients required long-term oxygen therapy.

2.2. Questionnaires

2.2.1. Pittsburgh Sleep Quality Index (PSQI)
The Pittsburgh Sleep Quality Index (PSQI) is a standardized self-reporting questionnaire to assess subjective quality of sleep over the previous month. PSQI has been validated in a number of populations and is one of the most widely-used instruments to measure sleep quality.

It consists of 19 items that yield a global sleep quality index and seven component scores: subjective sleep quality, sleep-latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction.

Each subscale was rated from 0 to 3 points and global score ranged from 0 to 21. A global PSQI score >5 is associated with significant sleep complaints and has a sensitivity of 89.6% and a specificity of 86.5% for distinguishing "good sleepers" from "poor sleepers" [17]. The internal consistency of the PSQI is good (Cronbach's α = 0.83 for component scores) as are test–retest reliability and diagnostic validity [17].

2.2.2. Hospital Anxiety and Depression Scale (HADS)
The Hospital Anxiety and Depression Scale (HADS) was developed by Zigmond and Snaith [18] in order to estimate anxiety and depression in somatically ill patients. The self-reporting validated instrument includes 14 items, a score of 8 or greater is an indicator for the presence of anxiety and/or depression.

2.2.3. Multidimensional Fatigue Inventory (MFI)
The Multidimensional Fatigue Inventory (MFI) is a 20-item self-reporting instrument with five dimensions: general fatigue, physical fatigue, reduced activity, reduced motivation and mental fatigue [19]. In line with Kuhnt et al. [20] the 75th percentile (53+) was used as the cut-off value for the MFI sum score indicating high levels of fatigue.

2.2.4. MRC dyspnea scale
The MRC dyspnea scale is used to classify the severity of self-reported dyspnea in daily activities. Patients were categorized into one of five levels ranging from level 1 ("normal") to level 5 ("too breathless to leave the house") [21].

2.3. Statistical analyses

The influence of gender, age and dyspnea on PSQI global score was tested using analysis of variance (ANOVA). Mean score differences between sarcoidosis patients and the general population in PSQI component scores were tested with the t-test. Effect sizes were calculated according to Cohen [22]. The relationship between sleep quality (three PSQI groups) and sociodemographic and clinical variables was tested with Chi^2-tests (categorical variables) and ANOVAs (metric variables). Furthermore, the impact of clinical variables on sleep quality was tested using multiple regression analyses with the PSQI global score as the dependent variable and the (single) clinical variables age, gender, BMI and education as the independent variables. All statistical tests were performed with SPSS version 17, the significance criterion was set to 0.05.

Table 1
Sociodemographic characteristics.

	Total number (n = 1197)		Men (n = 414)		Women (n = 783)	
	n	%	n	%	n	%
Age						
Mean ± SD	54.3 ± 11.6		54.0 ± 10.9		54.5 ± 12.0	
≤40 years	129	10.8	34	8.2	95	12.1
41–50 years	359	30.0	144	34.8	215	27.5
51–60 years	350	29.2	119	28.7	231	29.5
61–70 years	247	20.6	83	20.0	164	20.9
≥71 years	112	9.4	34	8.2	78	10.0
BMI						
Mean ± SD	27.6 ± 5.7		27.2 ± 4.4		27.8 ± 6.3	
<25	419	35.0	135	32.6	284	36.3
25- < 30	456	38.1	190	45.9	266	34.0
30- < 35	200	16.7	72	17.4	128	16.3
≥35	120	10.0	17	4.1	103	13.2
No information	2	0.2			2	0.2
Partnership						
Living with partner	950	79.4	361	87.2	589	75.2
Living without partner	235	19.6	50	12.1	185	23.6
No information	12	1.0	3	0.7	9	1.1
Employment						
Full-time	419	35.0	218	52.7	201	25.7
Part-time	227	19.0	36	8.7	191	24.4
Unemployed	66	5.5	15	3.6	51	6.5
Retired	461	38.5	141	34.1	320	20.9
No information	24	2.0	4	1.0	20	2.6
Education						
≤10 years	732	61.2	226	54.6	506	64.6
≥10 years	456	38.1	185	44.7	271	34.6
No information	9	0.8	3	0.7	6	0.8