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Research Paper

Factors associated with poor sleep quality in patients with multiple sclerosis differ by disease duration

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Abstract

Background: Sleep disturbance is a common symptom of multiple sclerosis (MS) and knowledge about factors that contribute to poor sleep quality is scarce.

Objective: The aim was to explore the differences in the prevalence and determinants of poor sleep quality in a sample of patients with MS with disease duration ⩽5 years and >5 years.

Methods: We collected data from 152 consecutive patients with MS; 66 patients (78% women, averaged 37.35 ± 10.1 years) were in the group with disease duration ⩽5 years and 86 patients (73.3% women, averaged 42.10 ± 9.4 years) in the group with disease duration >5 years. Patients filled out the Pittsburgh Sleep Quality Index, the Hospital Anxiety and Depression Scale, the Multidimensional Fatigue Inventory, one item of the Incapacity Status Scale regarding bladder problems and one item of the Short Form-36 regarding pain. Multiple linear regression was used to analyze the relationship between the study variables.

Results: The prevalence of poor sleep is significantly higher in patients with longer disease duration (34.8 vs. 51.2%). Anxiety, reduced motivation and mental fatigue (all $p < 0.05$) were associated with poor sleep quality in patients with disease duration ⩽5 years, whereas pain ($p < 0.01$), depression and mental fatigue (both $p < 0.05$) were in patients with disease duration >5 years.

Conclusion: Sleep problems are present in patients with MS with both short and long disease duration, but these problems are associated with different factors. These should be recognized and managed in addition to the treatment of sleep disorders.

Keywords: Multiple sclerosis; Quality of sleep; Disease duration; Anxiety; Pain

Sleep disturbances are common symptoms of multiple sclerosis (MS), and their prevalence ranges from 47 to 62%.[1–6] Patients with MS report reduced quality of night sleep more frequently compared with the healthy population,[1,3,7] and this association with poorer health-related quality of life is also known.[3,5] Merlino et al, in their analysis with 120 patients, found that poor sleep was an independent predictor of a patient's mental and physical quality of life.[5] While more is known about the high prevalence and impact of sleep disturbances on quality of life in patients with MS,[1–5] less is known about the factors that contribute to poor sleep quality.

Previous research has shown that poor sleep is associated with fatigue, mood disorders, pain, nocturia, sexual dysfunction and the use of medication[4,5,8,9]; however, these analyses used only descriptive statistical methods[4,8,9] or correlations.[5] Few studies have found several independent variables to be associated with a reduced quality of sleep.[6,7,10] A case control study by Bøe Lunde et al explored sociodemographic and clinical associations with poor sleep in a sample

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of 90 patients with MS and 108 sex- and age-matched healthy controls. The results indicated that poor sleep is independently associated with female gender, use of immunotherapy and the high psychological burden of MS.[7] Neau et al reported associations of sleep disorders with disability, depression, anxiety, pain, spasticity and bladder dysfunction in a univariate analysis, although in a multivariate analysis only depression, disability and pain remained associated with poor sleep.[6] Bamer et al, in their study with 473 patients, found that depression, leg cramps, younger age, pain, female gender, fatigue and nocturia were associated with reduced quality of sleep. Depression accounted for the majority of the variance in sleep problems. Except the variables mentioned above, this study also showed that shorter disease duration was associated with more severe sleep complaints.[10]

On the basis of previous studies we can expect different factors to be related to poor sleep quality in patients with shorter and longer disease duration. Patients in the early stage of disease have a lower Expanded Disability Status Scale (EDSS) score, and the symptoms of MS are not so severe in comparison with those having longer disease duration.[11] Therefore, we can rather expect psychological factors and mood disorders to contribute to poor sleep quality in these patients. Both depression and anxiety occur in patients with MS.[12,13] The prevalence of anxiety seems to be higher when compared with depression in an early stage of disease.[14] Janssens et al showed an increase in the occurrence of reported anxiety symptoms soon after the announcement of the diagnosis to patients with MS.[15] Patients with longer disease duration are more disabled, have greater problems with ambulation,[11] have a higher prevalence of pain[16] and more severe sphincter dysfunction[17] than patients with shorter disease duration. Based on this, we can expect that factors related to the disease itself could be associated with poor sleep quality in patients with longer disease duration.

To the best of our knowledge there is no study exploring the prevalence and factors associated with poor sleep quality separately by disease duration. Thus, the aim of our study was to explore the differences in prevalence and determinants of poor sleep quality in a sample of patients with MS with disease duration $\leqslant 5$ years and those with disease duration > 5 years.

Methods

Sample and procedure

The study comprised consecutive patients with MS from the eastern part of Slovakia. The patients were recruited between September, 2011 and May, 2013. Of the 241 patients with MS who were deemed eligible for the study, 182 patients initially agreed to participate (response rate of 76%). Patients with cognitive dysfunction determined by an MMSE score of <24 ($N = 1$) and those who initially agreed to participate but did not fill in the questionnaires ($N = 29$) were excluded. The final sample consisted of 152 patients.

The study was approved by the local Ethics Committee of the Faculty of Medicine, PJ Safarik University in Kosice, 2009. Each patient provided a signed informed consent form prior to the study.

The procedure started by sending an invitation letter, the questionnaires, a written informed consent form and a non-response sheet to the participants' home by postal mail. After two weeks, a trained interviewer called each patient in order to arrange a face-to-face interview, allowing clarification of the patient's responses and completion of missing answers in the questionnaires. A neurological examination was performed immediately after the interview; the same neurologist was used for all patients. Standardized neurological examination assessed seven functional systems: visual, brainstem, pyramidal, cerebellar, sensory, bowel/bladder and cerebral.

Measures

All questionnaires used in this study were translated from the original language. Next, a backwards translation was made to ensure that no meaning was lost in translation. Final changes in the translated version were made accordingly.[18]

Sleep quality

The Pittsburgh Sleep Quality Index (PSQI) is a self-rated questionnaire which assesses sleep quality and disturbances over a 1-month time interval.[19] Nineteen individual items generate seven component scores: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. Each component has a possible score of 0–3, where a higher score indicates a greater sleep problem.

The global PSQI score is the sum of all components scores (range 0–21); a score of >5 indicates poor sleep.[19] Cronbach's alpha was 0.87 in our sample.

Anxiety and depression

The Hospital Anxiety and Depression scale (HADS) is a self-administered 14-item scale with two subscales for detecting clinically significant depression (HADS-D) and anxiety (HADS-A).[20] Each item has response categories ranging from 0 (no problem) to 3 (extreme problem). The summary score for both subscales ranges from 0 to 21, with the higher score meaning worse condition. A score of 7 or lower indentifies non-cases, 8–10 possible cases, and $\geqslant 11$ definite cases.[20] In the present study Cronbach's alpha was 0.85 for the depression and 0.86 for the anxiety subscale.

Fatigue

Fatigue was assessed using the 20-item Multidimensional Fatigue Inventory (MFI-20), which measures five dimensions of fatigue: general fatigue, physical fatigue,