Original Research

Sleep Quality in Patients with Multiple Sclerosis

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Abstract

Background and Objective: Multiple sclerosis (MS) is an autoimmune neurologic disorder with higher prevalence in female adults. Patients with MS suffer from many consequences of the disease, which result in poor quality of life. In this study, we aimed to evaluate the sleep quality in patients with MS as an important aspect of their life and the relationship between sleep quality and different types of the disease, treatment, and individual characteristics.

Materials and Methods: A total of 152 patients diagnosed with MS at the department of neurology, West Azerbaijan Province, Iran, were enrolled in this cross-sectional study. Participants were asked to fill out a questionnaire consisting of demographic and disease characteristics, types of treatment, and the validated Persian version of Pittsburgh Sleep Quality Index (PSQI). PSQI score ≥ 5 and < 5 were categorized as poor and good sleep quality, respectively.

Results: In this study, the average of PSQI score in all patients was 9.28 ± 5.11. 105 patients (69.1%) had PSQI ≥ 5 (poor sleep quality); whereas 47 patients (31.9%) had PSQI < 5 (good sleep quality). The type of drug (Rebif) used by the patients had a significant effect on categories of self-reported sleep quality among patients (P = 0.01).

Conclusion: This study showed a high prevalence of poor sleep quality in patients with MS. More evaluations are needed for better management of sleep problems in these patients.

Keywords: Multiple sclerosis; Sleep; Interferon-beta

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Introduction

Multiple sclerosis (MS) is an autoimmune neurologic disorder with higher prevalence in female adults (1). Patients with MS suffer from many consequences of the disease, which result in poor quality of life (2, 3). According to relevant studies, sleep problems have been recognized in more than half of the patients with MS. It is shown that patients with MS had higher scores of Pittsburg Sleep Quality Index (PSQI). Insomnia in patients with MS is detected more frequently than general population, which could be due to the mood disorders. Higher prevalence of depression and anxiety is also reported in these patients (4-6).

Various sleep disorders reported by patients with MS include insomnia, limb movements, sleep-disordered breathing (SDB), narcolepsy, disrupted sleep, daytime sleepiness, and fatigue. Fatigue is prevalent in these patients and can be associated with sleep problems (7).

Reported factors with influence on sleep quality of patients with MS include pain, nocturia, mood disorders, medication, and disease severity. There are four types of MS that differ in severity as follows: Relapsing-Remitting MS (RRMS) is the most common type of the disease with temporary relapse periods at the time of new symptoms ap-

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pearance; Secondary-Progressive MS (SPMS) with symptoms steadily worsen with or without relapses and remissions; Primary-Progressive MS (PPMS), a rare form with slowly worsening symptoms from the beginning and no relapses or remissions; and Progressive-Relapsing MS (PRMS), a rare form with steadily worsening symptoms from the beginning with acute relapses but no remissions (8, 9). Consequent poor sleep and sleep deprivation has a negative effect on immune system and may inhibit the function of hypothalamus–pituitary–adrenal (HPA) system, results in lower glucose tolerance and higher rates of cardiovascular accidents. Chronic sleep loss plays an important role in different aspects of social and personal life such as driving and occupational performance and may lead to more errors and accidents (1, 10, 11).

Furthermore, studies have indicated different efficacy of drugs on disease severity and relapses, although the results were not statistically significant as reported by Mazdeh et al. (12). Several agents frequently have been used for treatment of MS including beta-interferons, glatiramer acetate, fingolimod, and teriflunomide (13).

Limited epidemiologic studies are available for contributing factors of poor sleep quality among patients with MS in Iran. More exploration of these factors would help clinicians for better management of the disease and quality of life in these patients. Accordingly, in this study, we aimed to evaluate the sleep quality in patients with MS as an important aspect of their life and also the relationship between sleep quality and different types of the disease, treatment, and individual characteristics.

Materials and Methods

Patients: A total of 152 patients diagnosed with MS at the department of neurology, West Azerbaijan Province of Iran, were enrolled in this cross-sectional study during 2012-2014. The patients with confirmed diagnosis of MS by a neurologist were randomly chosen. Patients in acute phase of the disease, or with other neurologic or cognitive impairments were excluded. Written consent was obtained from the participants and they were asked to fill out a questionnaire including demographic data, details of MS disease characteristics, treatment, and the validated version of PSQI in Persian.

Pittsburg Sleep Quality Index (PSQI): PSQI is a validated questionnaire, which evaluates the sleep quality over the last month. It includes 19 individual items with seven components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction with score from 0 to 3 for each part and with total score of 21. Total score ≥ 5 and < 5 is categorized as poor and good sleep quality, respectively (14).

Statistical analysis: Data were presented as mean ± standard deviation (SD) or frequency and percentage. Chi-square and Fisher's exact tests were used for comparisons. P-value < 0.05 was considered to be significant. Statistical analysis was performed by SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

Results

In the current study, the mean age of the patients was 35.39 ± 6.75 years. A total of 119 (78.3%) patients were women. Most of the participants were married and housekeeper. The education levels of diploma or higher and living in town were reported more by the subjects. Moreover, most of the patients had RRMS type of the disease for more than 5 years. The most common drug used by the patients was Cinnovex (Table 1).

Table 1. Demographic characteristics of the participants between two groups of patients with poor or good sleep quality

Variable		Total	PSQI ≥ 5	PSQI < 5	P-value
Sex	Men	33 (21.70)	23 (69.70)	10 (30.30)	0.93
	Women	119 (78.30)	82 (68.90)	37 (31.10)	
Marital status	Married	139 (91.40)	97 (69.80)	42 (30.20)	
	Single	9 (5.92)	6 (66.70)	3 (33.30)	0.53
	Divorced	4 (2.62)	3 (75.00)	1 (25.00)	
Job	Self employed	13 (8.50)	8 (61.50)	5 (38.50)	
	Jobless	1 (0.65)	1 (100)	0 (0)	
	Housekeeper	87 (57.33)	59 (67.80)	28 (32.20)	0.77
	Employee	49 (32.23)	35 (71.40)	14 (28.60)	
	Retired	2 (1.31)	2 (100)	0 (0)	
Educational status	No education	11 (7.23)	6 (54.50)	5 (45.50)	
	Under diploma	61 (40.00)	44 (72.00)	17 (28.00)	0.65
	Diploma and more	80 (52.00)	55 (68.00)	25 (32.00)	
Living place	Town	117 (76.97)	82 (70.10)	35 (29.90)	
	Village	24 (15.78)	17 (70.80)	7 (29.20)	0.55
	Suburb	11 (7.23)	6 (54.50)	5 (45.50)	

These values are presented as number (percent). PSQI: Pittsburg Sleep Quality Index

Table 2. Clinical characteristics of the participants between two groups of patients with poor or good sleep quality

Variable		Total	PSQI ≥ 5	PSQI < 5	P-value
Duration of the disease (year)	Lesser than 1	3 (1.97)	3 (100)	0 (0)	0.97
	1	11 (7.24)	7 (63.60)	4 (36.40)	
	1-5	41 (26.97)	28 (68.30)	13 (31.70)	
	More than 5	97 (63.81)	67 (69.10)	30 (30.90)	
Type of the MS	RRMS	120 (78.94)	85 (70.80)	35 (29.20)	0.18
	PPMS	17 (11.18)	9 (52.90)	8 (47.10)	
	SPMS	10 (6.57)	6 (60.00)	4 (40.00)	
	PRMS	5 (3.29)	5 (100)	0 (0)	
Type of the treatment	Cinnovex	71 (46.71)	50 (70.40)	21 (29.60)	0.01
	Avonex	15 (9.86)	15 (100)	0 (0)	
	Betaferon	21 (13.81)	15 (71.40)	6 (28.60)	
	Rebif	45 (29.60)	25 (55.60)	20 (44.40)	

These values are presented as number (percent).
PSQI: Pittsburg Sleep Quality Index; MS: Multiple sclerosis; RRMS: Relapsing-remitting multiple sclerosis; PPMS: Primary-progressive multiple sclerosis; SPMS: Secondary-progressive multiple sclerosis; PRMS: Progressive-relapsing multiple sclerosis

The mean PSQI score in patients was 9.28 ± 5.11. Of 152 patients, 47 ones (30.9%) had PSQI less than 5 and good sleep quality; whereas 105 ones (69.1%) of the participants reported PSQI score equal or greater than 5 and poor sleep quality.

There was no significant relationship between sleep quality categories and sex, marital or educational status, job, living place, duration, and type of the disease. Only the type of drug which was used by the patients had a significant effect on categories of sleep quality (P = 0.01). Table 1 shows the demographic characteristics of the patients and their relationship with PSQI score. Clinical characteristics of the participants in groups of patients with poor or good sleep quality are depicted in table 2. Patients with longer duration of the disease and with the types of RRMS and PRMS were more likely to report poor sleep quality, but the association was not statistically significant. However, type of drug used (Rebif) significantly affected reported sleep quality in study population with better reports for Rebif compared to the other drugs (Table 2).

Discussion

In the current study, more than half of the patients (69.1%) reported poor sleep quality, while the average of PSQI score in all patients was high 9.28 ± 5.11.

Consistent with this study, sleep problems are reported in more than half of the patients with MS (6, 7, 15). Merlino et al. evaluated sleep problems in a population of patients with MS and concluded that 54% of these patients suffer from sleep problems with mean PSQI score of 6.83 ± 4.53 (5). Moreira et al. also indicated poor sleep quality in 52% of patients with MS using PSQI (15). Our study findings are most consistent with Cowan's study which indicated that 63.3% of patients with MS had PSQI score ≥ 5 (16). In Iran, Ghaem and Borhani Haghighi evaluated the sleep quality among 140 patients with MS and reported a higher prevalence (87.2%) of poor sleep quality among studied population compared to the findings of the current study (7). Mean score of PSQI was higher in the current study compared to aforementioned studies of Merlino et al. (5), Moreira et al. (15), and Cowan (16). Different cultural issues in answering the questions of PSQI and geographical location plus different study methodologies may be the source of different statistics. Disease severity and the pain plus concomitant comorbidities and sleep disorders may be the leading cause of poorer sleep quality in our patients that needs more investigation. Restless legs syndrome (RLS), SDB, and depression are reported as the leading etiologies of poor sleep quality in patients with MS (4). The higher prevalence may be related to the difference in study populations regarding this issue. Different severity of disease and disease types may also lead to different levels of disturbed sleep among population of these patients as they lead to consequences such as pain, comorbid psychiatric problems, and etc.

In this study, sleep quality categories did not have significantly statistical associations with sex, marital or educational status, job, living place, and duration and type of the disease which is consistent with Moreira et al. study (15). Only the type of drug used by the patients had a significant association with good sleep quality. This result can be due to the effect of different medications for MS on sleep or the disease severity and relapses (17). Moreover, different severity of dis-

ease among study participants and duration of using these drugs and management follow-up could lead to different results regarding influence of drugs on sleep quality of patients. It is noteworthy that the reported sleep characteristics were subjective and based on self-reports of patients that may lead to inconclusive results in terms of drugs. Mazdeh et al. reported that Rebif might reduce relapse rate more than Betaferon and Avonex. However, they did not find any significant results (12). Thus, any conclusive results regarding the effect of drugs used for MS management on sleep quality should be made with more caution, and conducting randomized clinical trials based on objective sleep studies such as polysomnography (PSG) would be a more sophisticated approach (17). In future studies, investigation of pain, anxiety, depression, and other sleep disorders such as periodic limb movement disorder, sleep breathing problems, and psychiatric diseases that could lead to poor sleep quality in patients with MS should be kept in mind (6). Furthermore, consideration of objective measures of sleep and appropriate study designs with larger sample sizes would provide appropriate information for clinical management of sleep problems in these patients (17).

Limited sample size and lacking objective measures such as actigraphy and PSG are considered as limitations of the current study.

Conclusion

This study showed a high prevalence of poor sleep quality in patients with MS. Sleep quality and problems are overlooked among these patients and may be only attributed to the MS, while other sleep disorders should be managed and evaluated to reach a good sleep in this population, as poor sleep affects the quality of life in patients with MS. More detailed studies with objective measures of sleep are recommended for further evaluation of sleep problems in such patients.

Conflict of Interests

Authors have no conflict of interests.

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