Sleep disturbances in restless legs syndrome

Poremećaj spavanja zbog sindroma nemirnih nogu

Jasmina Jović*, Marina Svetel†, Tatjana Pekmezović‡, Vladimir S. Kostić†

***General Hospital „Dr Radivoj Simonović" Sombor, Serbia; Clinical Center of Serbia,
†Clinic of Neurology, Belgrade, Serbia; University of Belgrade, Faculty of Medicine,
‡Institute of Epidemiology, Belgrade, Serbia**

Abstract

Background/Aim. Resteless legs syndrome (RLS) is chronical neurological disorder characterized by urge to move legs that is usually accompanied by unpleasant sensations in the lower extremities. Sleep disturbance is one of the main accompanying symptoms of RLS which exists in approximatelly 90% of patients. Impairment of sleep is related to daily sleepiness, depressive and anxiety disorders. The aim of this study was to detect frequency and characterisitics of sleep-related symptoms in patients with RLS, and its impairrment to daily sleepiness, fatique, anxiety and depression. **Methods.** We have examined 94 patients with RLS. The diagnose of RLS was based on questionnaire with 4 specific questions according to the International Restless Legs Syndrome Study Group (IRLSSG) criteria updated in 2003. Severity of symptoms was astimated with IRLSSG Rating Scale, depression and anxiety with Hamilton Depression Rating Scale (HDRS) and Hamilton Anxiety Rating Scale (HARS) and sleepiness with Epworth Sleepiness scale (ESS). We astimated sleep characteristics and disturbances with specific questionnaire. **Results.** In our study 79.9% of patients had sleep-related symptoms. Average sleep duration was 6.50 ± 1.42 hours, with average frequency of awakening 2.34 ± 1.69 times per night. Average ESS score was 5.12 ± 4.08 (0–17). Patients with more severe symptoms had higher degree of sleepiness ($p = 0.005$). Patients with higher symptoms frequency, significantly more often had sleep disturbance ($p = 0.016$), tiredness and daily sleepiness ($p = 0.001$). Daily sleepiness (ESS) also significantly correlates with depression ($p < 0.05$) and anxiety ($p = 0.012$). **Conclusion.** Our results confirm that sleep disturbances are one of the key accompanying symptoms of RLS which cause daily sleepiness, tiredness, depression and anxiety. Therefore, their early recognition and appropriate treatment must be a priority in RLS patients.

Key words:
restless legs syndrome; sleep disorders; anxiety; depression; fatigue; surveys and questionnaires.

Apstrakt

Uvod/Cilj. Sindrom nemirnih nogu (SNN) je hronična neurološka bolest koju karakteriše potreba za pomeranjem nogu udružena sa neprijatnim senzacijama u donjim ekstremitetima. Poremećaji spavanja spadaju u glavne prateće simptome SNN koji se javljaju kod oko 90% bolesnika. Poremećaji spavanja dovode do dnevne pospanosti, depresivnosti i anksioznosti. Cilj ove studije bio je da detektuje učestalost i karakteristike poremećaja spavanja kod bolesnika sa SNN, kao i njihov uticaj na dnevnu pospanost, umor, anksioznost i depresivnost. **Metode.** Ispitano je 94 bolesnika sa SNN. Dijagnoza SNN postavljena je na osnovu kriterijuma Internacionalne grupe za proučavanje sindroma nemirnih nogu (*International Restless Legs Syndrome Study Group* – IRLSSG) iz 2003. godine. Težina kliničke slike procenjena je pomoću IRLSSG *roling scale*, depresivnost i anksioznost Hamiltonovom skalom za procenu depresivnosti i anksioznosti, a pospanost Epworthovom skalom pospanosti. Posebnim upitnikom ocenjivali smo karakteristike sna i njegove poremećaje. **Rezultati.** U našoj studiji 79,9% bolesnika imalo je poremećaje spavanja. Prosečna dužina sna bila je $6,50 \pm 1,42$ sati sa prosečnim buđenjem $2,34 \pm 1,69$ puta u toku noći. Prosečan skor na Epworthovoj skali pospanosti bio je $5,12 \pm 4,08$ (0–17). Bolesnici sa većom učestalošću tegoba imali su statistički značajno veći stepen pospanosti ($p = 0,005$). Bolesnici sa većom učestlošću tegoba imali su češće poremećaje spavanja ($p = 0,016$), umor i dnevnu pospanost ($p = 0,001$). Dnevna pospanost značajno je korelirala sa depresivnošću ($p < 0,05$) i anksioznošću ($p = 0,012$). **Zaključak.** Naši rezultati potvrđuju da su poremećaji spavanja ključni prateći simptomi SNN koji uzrokuju dnevnu pospanost, umor, depresivnost i anksioznost. Zato je njihovo rano prepoznavanje i adekvatno lečenje od velikog značaja.

Ključne reči:
sindrom nemirnih nogu; spavanje, poremećaji; anksioznost; depresija; zamor; ankete i upitnici.

Correspondence to: Jasmina Jović, General Hospital „Dr Radivoj Simonović" Sombor, Branka Radičevića 6, Sombor, Serbia.
E-mail: jasmina.s.jovic@gmail.com

Introduction

Resteless legs syndrome (RLS) is a chronic neurological disorder characterized by urge to move legs which is usually accompanied by unpleasant sensation in the lower extremities. It begins or worsens during the periods of rest (during the evening and nighttime hours), and it is partially or totally relieved by movement [1]. Prevalence of RLS in general population of Caucasians is ranging from 3.2% to 23.5% [2], which we have confirmed in the population of Sombor (Serbia) with prevalence of 5.1% (95% CI 4.2–6.2) and after correction (age-adjusted by European standard population) 4.4% (95% CI 3.6–5.4) [3]. Sleep disturbance is one of the main accompanying symptoms of RLS which exists in approximatelly 90% of patients and conversely, in 20% patients with insomnia, it is due to RLS [4]. Impairment of sleep is related to daily sleepiness, depressive and anxiety disorders [2] and also to cardiovascular and cerebrovascular diseases [5], cognitive and short attention impairment, executive functions and verbal fluency [6].

The aim of this study was to detect frequency and characterisitics of sleep-related symptoms in patients with RLS, and its impairment to daily sleepiness, fatique, anxiety and depression.

Methods

In our study we examined 94 patients with RLS, which had previosly been detected in the study of prevalence of RLS and the results of which have already been published [3]. The diagnose of RLS was based on questionnaire with 4 specific questions, essential criteria for RLS, and 3 additional questions, supportive criteria, according to the International Restless Legs Syndrome Study Group (IRLSSG) criteria updated in 2003 [1]. All patients have been examined in the General Hospital in Sombor and Clinic of Neurology in Belgrade, where they completed questionnaire with clinical and demographic data. The questionnaire was specificaly created for this study. Severity of symptoms were detected with International rating IRLSSG Rating Scale [1], depression and anxiety with Hamilton Depression Rating Scale (HDRS) [7] and Hamilton Anxiety Rating Scale (HARS) [8], respectively, and sleepiness with Epworth Sleepiness Scale (ESS) [9]. We have detected sleep characteristics and disturbances with specific questionnaire about sleep latency, occurrence, duration and characteristics of symptoms at the time of falling asleep, quality and continuity of sleep, and frequency and number of awakenings during night.

Results

We investigated 94 patients with primary RLS whose clinically-demografic data is shown in Table 1. The most severely affected subjects were ones with significantly more frequent symptoms of RLS ($p = 0.001$). Amongst 94 patients only 11 previosly had diagnosis of RLS, and only 7 had adequate therapy with dopa-agonist. Some patients (28/94) had been treated with sedatives, antidepressants, hypnotics or its combination.

In our study 79.9% of patients had sleep-related symptoms, 56.4% had problems with sleep continuity, 45.7% of patients had RLS related problems during night in duration of more than one hour, and 11.7% of patients had these problems in duration of more than three hours. Average sleep duration was 6.50 ± 1.42 hours, with average frequency of awakening 2.34 ± 1.69 times per night. Symptoms, in the case of our patients, would mostly begin at the moment of falling asleep, between 22–24 h (78.7%), then about 18 h (12.8%), or before 18 h (8.5%). Average sleep latency was 62.0 ± 45.36 min. None of the patients was on dopa-agonist therapy, but 27.6% was treated with benzodiazepines, 4% with antidepressants and 7.9% with some of the combinations of benzodiazepines, antidepresssants and hypnotics, with poor effect on sleep-related symptoms.

Table 1
Clinical and demographic data of patients with restless legs syndrome (RLS)

Parameters	Values
Total number of patients	94
Gender, n	
female	67
male	27
Age in the moment of investigation (years) $\bar{x} \pm$ SD	58.91 ± 13.42
Age in a moment of beginning of symptoms (years) $\bar{x} \pm$ SD	44.3 ± 14.2
Frequency of RLS, %	
permanent	32.4
progressive	18.9
intermittent	48.6
> 1x a week	63.8
≤ 1x a week	36.2
Severity of symptoms (IRLSSGS), %	
mild	41.5
moderate	48.9
severe and very severe	9.6

IRLSSGRS – International Restless Legs Syndrome Study Group Rating Scale.
$\bar{x}$ – mean value; SD – standard deviation; n – number of patients; % – percentage of patients.

Average ESS score was 5.12 ± 4.08 (0–17). Totally 22.3% of patients had severe sleepiness and needed medical treatment and following-up, and 12.8% of patients had moderate sleepiness (score 7–8). No sleepiness during the day was found in 64.9% of patients (score 0–6), even though most of them had problems with sleep continuity.

We found a statistically significant correlation between severity of symptoms according to IRLSSG rating scale and sleepiness according to ESS – patients with more severe symptoms had higher degree of sleepiness ($p = 0.005$), but their duration had no influence on sleepiness. Frequency of symptoms also had significant influence on sleep disturbances, tiredness and daily sleepiness. Patients with higher frequency symptoms, acording to the statistics, significantly more often had sleep disturbances ($p = 0.016$), tiredness and daily sleepiness ($p = 0.001$) (Table 2). Daily sleepiness (ESS) also significantly correlated with depression (HDRS) ($p < 0.05$) and anxiety (HARS) ($p = 0.012$).

longer twice than in the REST study – 62.0 minutes. Our patients would wake-up two to three times per night, like in other investigations.

Severity of symptoms correlated with sleep disturbances, so subjects with moderate and severe disease had sleep duration less then 5 hours per night (50%), or even less then 3 hours per night (14%), and their sleep was less efficient because, in our study, symptoms were related to sleep initiation (22–24 h) in 78.7% or started during afternoon (18 h). Only 10.6% had symptoms after falling asleep (1–2 a.m.) [11]. Duration of sleep-related symptoms was, in the case of our patients, longer than one hour in 45.7%, and longer than three hours in 11.7%, with significant sleep impairment. Average sleep duration was 6.5 hours.

As a consequence of chronic sleep disturbances patients may feel irritabile, have a lack of initiative, memory disturbances, depression and anxiety [12]. This leads to social isolation and problems in daily activities [13]. These patients more

Table 2

Correlation of symptoms frequency, sleep disturbances and mood in patients with restless legs syndrome (RLX)

IRLSSGRS	Patients (n = 94) n (%)	Frequency of symptoms		p
		< 1x per week, (n = 34) n (%)	≥ 1x per week, (n = 60) n (%)	
Sleep disturbances				
no	17 (18.1)	11 (32.4)	6 (10.0)	
mild	14 (14.9)	7 (20.6)	7 (11.7)	0.016
moderate	18 (19.1)	4 (11.8)	14 (23.3)	
severe	30 (31.9)	10 (29.4)	20 (33.3)	
very severe	15 (16.0)	2 (5.9)	13 (21.7)	
Daily tiredness or sleepiness				
no	32 (34.0)	18 (52.9)	14 (23.3)	
mild	25(26.6)	11 (32.4)	14 (23.3)	
moderate	25 (26.6)	5 (14.7)	20 (33.3)	0.001
severe	12 (12.8)	0 (0.0)	12 (20.0)	
very severe	0 (0.0)	0 (0.0)	0 (0.0)	

IRLSSGRS – International Restless Legs Syndrome Study Group Rating Scale.
n (%) – number (percentage) of patients.

Discussion

Our results showed that more than 4/5 of our patients had some kind of sleep disturbances, and more than a half suffered from disruption of sleep continuity. Severity of symptoms correlated with their frequency, and also with sleep disturbances, tiredness and daily sleepiness. A degree of daily sleepiness positively correlated with depression and anxiety.

Sleep disturbance is one of the most important symptoms in RLS. Individuals with RLS are two to three times more likely to report these symptoms then non RLS subjects [2]. In the REST study [10], carried out in several European countries and in the United States of America, patients mostly had inability to fall asleep (48.1%), inability to stay asleep (39.2%), disturbed sleep (60.6%) and insufficient sleep (40.1%). Over two-thirds of the patients took 30 minutes or more to fall asleep, and 60% awoke three or more times per night. Similary, our study [3] showed disturbed sleep in 79.7% of patients, and 56.4% had difficulties in sleep maintaining, like in REST study [10]. Average sleep latency was

often have episodes of night smoking and eating than healthy population [14].

Daytime sleepiness is one of the expected consequences of sleep deprivation, but there are contradictory results in different studies. In some of them there was converging evidence that around 20–25% of subjects with untreated idiopathic RLS are likely to experience increased daytime sleepiness [15], and 32–42% excessive sleepiness [2]. Excessive sleepiness is two to three times higher than in healthy population [2]. For daytime sleepiness assessment we used ESS. Average score was 5.12 ± 4.08 (0–17). No sleepiness during the day was found in 64.9% of patients (score 0–6), even though they had problems with sleep continuity, 12.8% had moderate sleepiness and 22.3% suffered from severe sleepiness and they needed medical treatment and following-up. Daytime sleepiness statisticaly correlated with disease severity; according to IRLSSG – patients with more severe simptoms had a higher degree of daytime sleepiness. Duration of symptoms had no influence on sleepiness. Similar results were found in a study of Kim et al. [16] with also positive correlation between simp-

toms of severity according to IRLSSG Rating Scale and sleepiness according to ESS. In accordance with what was already mentioned above, there was a correlation of frequency of RLS symptoms and sleep disturbances, tiredness or sleepiness during the day estimated by IRLSSG Rating Scale. Sleep disturbances due to RLS were also significantly more common among RLS sufferers with frequent symptoms.

Sleep disorders can cause depression and anxiety [17]. Insomnia is independent factor for depression, but depression may be a consequence of other factors which disturb quality of life like social isolation and the chronic nature of the disease. Depression and anxiety appears at least twice as often in RLS patients than in healthy population [2, 18]. In our investigation daily sleepiness (ESS) significantly correlated with depression (HDRS) and anxiety (HARS), and conversely – patients with higher scores on HDRS and HARS had statisticaly significantly more often daily sleepiness.

Conclusion

Our results confirm that sleep disturbances are ones of the key accompanying symptoms of RLS which cause daily sleepiness, tiredness, depression and anxiety. Therefore, their early recognition and appropriate treatment must be a priority for RLS patients.

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