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Restless Leg Syndrome is Prevalent in Military Veterans with Post-Traumatic Stress Disorder and Sleep Disturbances

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Abstract

Introduction: While Restless leg syndrome (RLS) is a common sleep related movement disorder with a negative impact on sleep, quality of life and health, it may remain underdiagnosed for years. This study aims to evaluate RLS in military veterans with post-traumatic stress disorder (PTSD) suffering from sleep disturbances.

Material and methods: Thirty-One Iranian male military veterans diagnosed with PTSD entered this study. None of them had diabetes, Parkinson's disease and renal failure or were taking medications affecting RLS. Daytime sleepiness, anxiety and depression, RLS severity and the risk of obstructive sleep apnea (OSA) were assessed by standard questionnaires.

Results: The mean age was 51.6 ± 6.1 years. The most common complaint was difficulty falling asleep. Eight individuals (25.5% of participants) had RLS. All of them had evidence of OSA based on the STOP-BANG questionnaire. The severity of RLS was not associate with sleepiness, depressive symptoms and body mass index (BMI), but with anxiety symptoms.

Conclusion: RLS should be taken into consideration in veterans with PTSD, particularly in those with sleep disturbances including insomnia, sleep related movements and sleep apnea.

Keywords: Insomnia; Military veterans; Nightmare; Obstructive sleep apnea; Post-traumatic stress disorder; Restless leg syndrome; Sleep related movements

Introduction

Combat veterans are at risk of health threats such as post-traumatic stress disorder (PTSD) [1], cardiovascular diseases [2], sleep related disorders or combinations of these conditions [3]. Sleep disturbances are frequently associated with PTSD. The most common symptoms are insomnia and nightmares [4-6]. Elevated frequencies of sleep-related movement disorders among PTSD veterans, like periodic limb movement of sleep (PLMs), have also been reported [3,7,8]. On the other hand, while restless leg syndrome (RLS) is a common sleep related movement disorder [9,10], there are few studies assessing it in PTSD [11].

The International Restless Legs Syndrome Study Group (IRLSSG) defined four criteria to make a diagnosis of RLS: 1) an urge to move the legs due to some unpleasant sensations; 2) the unpleasant sensations are relieved by movement; 3) the symptoms become worse at night; and 4) the symptoms also become worse at rest [12]. Because of these nocturnal symptoms, sleep disturbance and insomnia are common presentations of RLS [13,14]. In addition, RLS may accompany other sleep disorders like obstructive sleep apnea and PLMs [13].

Accordingly, investigation for RLS is reasonable in any type of sleep disorders, which are significantly prevalent among PTSD veterans [3,4]. This study aimed to evaluate RLS presentation in an Iranian population of military veterans with PTSD. To best of our knowledge, the current study is the first one that focuses on the presentation and severity of RLS in veterans with PTSD.

Materials and Methods

This cross-sectional study was conducted on military veterans with sleep complaints attending the sleep laboratory of Ebn-e-Sina Hospital, Mashhad, Iran, between September 2014 and May 2015. The Ethics Committee of the Mashhad University of Medical Sciences (registered number 921368) approved the study. According to exclusion and inclusion criteria, 31 male military veterans were enrolled. A check list covering chief complaints and demographic data (including weight, height, and BMI) was obtained for each participant. The participants were interviewed and examined by a neurologist.

Inclusion criteria

1) Military veterans attending the Iraq-Iran (1981-1988), which approved by the Foundation of Martyrs and Veterans (a national organization in charge of veteran's affairs), with sleep complaints were

enrolled. Out of the initially 87 people, 83 agreed to participate in this study

2) Considering exclusion criteria (see below), Forty-five persons were interviewed by a neurologist to evaluate for RLS based on IRLSSG criteria. 3) PTSD was confirmed in 31 participants by a psychiatrist.

Exclusion criteria

1) Concomitant Parkinson's disease, kidney failure and diabetes, which predispose or worsen RLS [15]. 2) Usage of medication or substances which affect the RLS symptoms during the previous fortnight. These include sedating antihistamines, **Selective serotonin reuptake inhibitor**s (SSRIs), tricyclic antidepressants, antipsychotics and alcohol, which trigger or worsen RLS [16]; and gabapentin, pregabalin, clonazepam, dopa-agonists and opiates, which alleviate the symptoms [17].

Tools

The following questionnaires were applied for assessing related conditions: 1) The Epworth Sleepiness Scale (ESS) scoring was applied to evaluate daytime sleepiness. It includes eight items rated on a 4-point scale (0–3), evaluates the chances of falling asleep while engaged in eight different diurnal situations [18]. 2) Beck Anxiety Inventory (BAI); and 3) Beck Depression Inventory (BDI): The BAI measures the severity of **anxiety** and is rated on a 3-point scale, with each question being scored as 0 to 3 [19]. The BDI assesses the severity of depression and is rated on a 4-point scale ranging from 0 to 3 based on the severity of each item. The cut-off scores are 0-9 (minimal depression), 10-18 (mild depression), 19-29 (moderate depression), and 30-63 (severe depression) [20]. 4) International Restless Legs Syndrome Rating Scale: it rates the severity of RLS symptoms by 10 questions scored as 0 to 4 scales [21]. 5) For screening obstructive sleep apnea (OSA), which is prevalent among military veterans [3], STOP-BANG questionnaire was applied. It consists of 8 yes/no questions. More than three positive response suggest the probability of OSA [22] The Validity and reliability of these questionnaire has been proven in the Iranian population [19-22].

Variables	Minimum	Maximum	Mean	Std. Deviation
BMI	23.00	38.90	29.6290	4.23715
ESS	1.00	24.00	9.8065	5.58223
AGE	41.00	62.00	51.6129	6.16808
RLS severity score	.00	30.00	6.2258	7.89392
BAI	10.00	34.00	20.3226	8.12152
BDI	12.00	32.00	22.0645	5.35372
STOP-BANG	2	8	5.44	2.345

BMI: Body Mass Index; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory. ESS: Epworth Sleepiness Scale; RLS: Restless Leg Syndrome.

Table 1: Descriptive statistics.

Variables	Frequency	Percentage
Restless leg syndrome	7	22.5
Abnormal movement during sleep	4	12.9
Nightmare	7	22.6
Difficulty to falling asleep and/or maintaining sleep	10	32.3
Daytime sleepiness	6	19.4
Morning headache	3	9.7
Morning headache	1	3.2
Total	31	100.0

Table 2: The frequency and percentage of chief complaints.

Variables		BMI	ESS	AGE	RLS	BAI	BDI
N		31	31	31	31	31	31
Normal Parametersa,b	Mean	29.6290	9.8065	51.6129	6.2258	20.3226	22.0645
	Std. Deviation	4.23715	5.58223	6.16808	7.89392	8.12152	5.35372
	Absolute	0.077	0.127	0.119	0.336	0.144	0.127
Most Extreme Differences	Positive	0.069	0.122	0.119	0.336	0.144	0.127
	Negative	-0.077	-0.127	-0.099	-0.215	-0.118	-0.112
Kolmogorov-Smirnov Z		0.430	0.706	0.664	1.871	0.803	0.708
Asymp. Sig. (2-tailed)		0.993	0.702	0.770	0.002	0.540	0.698

a. Test distribution is Normal, b. Calculated from data.

Table 3: One-Sample Kolmogorov-Smirnov Test.

Results

Thirty-One Iranian male military veterans with sleep complaints suffering from PTSD were evaluated for RLS and related problems. The mean age was 51.6 ± 6.1 and the mean elapsed time from combat exposure was 27.9 ± 3.8 years. The most common complaint was difficulty to falling asleep and/or maintaining sleep, following by nightmares. Descriptive statistics and chief complaints are demonstrated in Tables 1 and 2.

Seven participants (22.5% of the participants) fulfilled the four criteria for RLS. The mean IRLSRS score for them was 17.7 ± 9.9 (in moderate range). Their chief complaints were nightmare (2 persons), difficulty to falling asleep and/or maintaining sleep (2), abnormal movement during sleep (2) and sleepiness (one of them). Regarding the correlation between the RLS severity score and the assessed parameters, only with BAI was significant (Tables 3-5).

Variables		BMI	ESS	AGE	BAI	BDI
BMI	Pearson Correlation	1	0.262	-0.144	-0.037	-0.211
	Sig. (2-tailed)	-	0.154	0.439	0.843	0.254
	N	31	31	31	31	31
ESS	Pearson Correlation	0.262	1	-0.136	0.061	0.018
	Sig. (2-tailed)	0.154	-	0.466	0.745	0.922
	N	31	31	31	31	31
AGE	Pearson Correlation	-0.144	-0.136	1	0.067	0.195
	Sig. (2-tailed)	0.439	0.466	-	0.720	0.294
	N	31	31	31	31	31
BAI	Pearson Correlation	-0.037	0.061	0.067	1	0.446*
	Sig. (2-tailed)	0.843	0.745	0.720	-	0.012
	N	31	31	31	31	31
BDI	Pearson Correlation	-0.211	0.018	0.195	0.446*	1
	Sig. (2-tailed)	0.254	0.922	0.294	0.012	-
	N	31	31	31	31	31

*. Correlation is significant at the 0.05 level (2-tailed).

BMI: Body Mass Index; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory. ESS: Epworth Sleepiness Scale; RLS: Restless Leg Syndrome.

Table 4: Correlations.

Variables	With RLS	Without RLS
Number	7	24
Mean BMI	28.98	29.81
Mean ESS	9.11	9.90
Mean BAI	24.72	19.22
Mean BDI	23.1	21.97
Mean Age	50.88	51.79

BMI: Body Mass Index; BAI: Beck Anxiety Inventory; BDI: Beck Depression Inventory. ESS: Epworth Sleepiness Scale; RLS: Restless Leg Syndrome.

Table 5: Compares the assessed parameters of individuals with RLS and without it.

Discussion

Seven participants out of 31 male military veterans with PTSD suffering from sleep related problems had RLS in our study. Predisposing conditions including renal failure, diabetes and medications had been excluded. Meanwhile, it should be emphasized that such conditions which worsen RLS are prevalent among chronic PTSD veterans in particular diabetes [23] and usage of antidepressants [24].

RLS is a common disorder with estimated prevalence between 5 to 10% in western countries [25] and with lower range in Asian countries [11]. Higher prevalence is reported in certain conditions such as renal failure (more than 25%) [26], pregnancy (up to 21%) [27] and neuropathies (around 10%) [28]. The relationships between RLS and cardiovascular disorders and death have been demonstrated in several studies [29-31]. Also, RLS has been shown to be associated with depression [32]. As such conditions are common comorbidities in combat veterans with PTSD [3], investigation for symptoms of RLS in these individuals may be of important value.

The high presence of RLS in our subjects (22.5%) suggest that PTSD in veterans may be associated with RLS. Till now, there is a paucity of research studies that evaluate the association of RLS and PTSD [11,16]. In a Korean study conducted on general population, the lifetime diagnosis of PTSD was associated with RLS [11]. While the explanation for this co-occurrence has remained uncertain, sleep disturbance is the intersections of the two conditions [16]. Insomnia, nightmares, sleep related movement and daytime sleepiness are frequently reported symptoms by PTSD veterans [33]. In our study, while all of subjects had a complaint of sleep disturbances and depressive and anxiety symptoms, there was statistically significant association between RLS scores and anxiety severity representing by BAI. RLS score was not related with other parameters.

Also, all of our RLS patients had scores of STOP-BANG of more than 4. RLS has been shown to be prevalent in sleep-related breathing disorders including OSA [13]. On the other hand, OSA is a common condition in military veterans [3]. Altogether, a detailed history is essential in management of PTSD of military veterans with sleep problems. While negative effects of RLS on mental and physical health have been proven in a large body of studies, it may remain underdiagnoses, because the symptoms overlap with other sensory and motor disorders [34].

There are studies using polysomnography that showed high index of periodic limb movements of sleep (PLMS), a sleep related movement disordering PTSD veterans [3,8,35]. As PLMS are the most important objective findings of RLS, it can be expected that RLS is prevalent in these patients. To best of our knowledge, the current study for the first time shows high frequency of RLS among military veterans suffering from PTSD and sleep disturbances. However, small sample size is a limitation of our study. Further studies with larger samples and evaluate RLS in PTSD and Non-PTSD veterans are recommended.

Conclusion

Evaluation for RLS in veterans with PTSD is highly recommended, in particular at the presence of sleep related complaints including insomnia, movements during sleep, daytime sleepiness and nightmare.

Acknowledgements

Conflicts of interest

The authors declare that they no conflict of interest.

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