

COMPARISON OF SLEEP DISTURBANCES IN POST-TRAUMATIC STRESS DISORDER AND DEPRESSION PATIENTS

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SUMMARY – The aim of this study was to explore differences in the intensity of depressiveness, sleep disturbances and sleepiness between post-traumatic stress disorder (PTSD) patients and patients with depression. A total of 170 patients were examined, including 120 PTSD patients and 50 patients with depression. All participants completed the Beck Depression Inventory, Pittsburgh Sleep Quality Index and Epworth Sleepiness Scale. The results showed difference in the subjective assessment of sleep quality between the war veterans with PTSD and civilians with depression, without significant differences between them in the level of depressiveness and sleepiness. Considering the fact that insomnia can occur as an early, covert sign of both PTSD and depression and that differences in the intensity of sleep disturbances between the groups were established, the use of these and similar instruments for the assessment of sleep quality can be useful in distinguishing patients with PTSD and depression, treatment of their sleep disturbances, and prevention of more severe symptoms in both diagnostic categories.

Key words: Stress disorders, post-traumatic; Depressive disorder; Sleep wake disorders

Introduction

Insomnia is the most common sleep disturbance and is often associated with concurrent psychiatric illness, particularly with anxiety and mood disorder¹. Sleep complaints have been incorporated in the official diagnostic criteria for many mental disorders, such as major depression, post-traumatic stress disorder (PTSD), generalized anxiety disorder and substance-related disorder². A meta-analysis of 177 studies showed that although no single sleep variable appeared to have absolute specificity for any particular psychiatric disorder, some patterns of sleep disturbances were found to be associated with certain categories of psy-

chiatric illnesses³. Difficulties with sleep onset and sleep maintenance, as well as nightmares are listed among diagnostic criteria based on which the diagnosis of both PTSD and depression can be made⁴.

Findings of studies that aimed to objectify sleep disturbances in PTSD patients and patients with depression are highly inconsistent⁵. The symptoms observed in patients with depression are shortened REM latency, more frequent early morning awakenings, and hypersomnia in 10%-15% of patients. Difficulties in falling asleep, prolonged REM latency and frequent nightmares were observed in PTSD patients^{6,7}.

Considering that insomnia is a common clinical symptom in both depression and PTSD, and that depression is one of the most frequent comorbid disorders in patients with PTSD, one can conclude that there is a link in the relation between depression, PTSD and insomnia. However, causal relationship between these three clinical entities is much more com-

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plex that it seems. Findings of many previous studies indicate that insomnia is not only a symptom but the result of the aforementioned psychiatric disorders⁸. A recent study shows that insomnia is an early warning sign of developing depression and that it occurs about five weeks before the first depressive episode⁹. Timely recognition and treatment of insomnia can put off the first depressive episode and reduce the frequency of depressive episodes, or at least prevent development of chronic depression⁹. Hence, treatment options for insomnia can also be used to effectively treat depression¹⁰. As with depression, insomnia can be a predictive factor for PTSD. Some studies show that sleep difficulties that begin during the month after a trauma can predict development of PTSD a year after, and that fragmented REM patterns within the month after the trauma can be associated with subsequent occurrence of PTSD^{11,12}.

Insomnia is a relevant early predictive factor for both depression and PTSD. Because of a frequent overlap of symptoms of depression and PTSD, an accurate assessment of characteristics of insomnia is important in making the differential diagnosis of these two disorders, which in turn is important for choosing the most appropriate therapeutic approach¹³. The importance of a correct differential diagnosis, as well as the fact that only a small number of studies compared the characteristics of sleep disturbances in depression and PTSD, points out the need for further exploration of this problem.

Our hypothesis, based on differences in polysomnographic results of PTSD patients and patients with depression, was that the clinical manifestation of insomnia in these two disorders will also be different. The aim of this study was to explore differences in the intensity of depressiveness, sleep disturbances and sleepiness between PTSD patients and patients with depression.

Subjects and Methods

Subjects

The study recruited a convenient sample of 192 participants including 135 war veterans with chronic PTSD and 57 civilians with depressive disorder treated in the Regional Center for Psychotrauma (RCP) of the Clinical Department of Psychiatry, Split Univer-

sity Hospital Center in Split. The study included patients with chronic PTSD treated either in the RCP day hospital or in a therapeutic club between July 2007 and December 2008, and patients with depression diagnosed and treated in the same period. The diagnosis of PTSD and depressive disorder was based on the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Depressive patients did not have lifetime PTSD.

Exclusion criteria were central nervous system disease, alcoholism, drug addiction, acute psychosis, and below-average intelligence. Data on the participants' intelligence were obtained from their medical records and previous psychological testing. Out of the 135 examined veterans, 15 were excluded (5 alcoholics, 3 drug addicts and 7 incompletely filled out questionnaires). Out of 57 patients with depression, 7 were excluded (2 below-average intelligence and 5 incompletely filled out questionnaires). The study finally included 120 PTSD patients and 50 patients with depression. There were 133 men and 37 women in the sample, ranging in age from 20 to 65 years. The mean age (\pm standard deviation) of male participants was 44.3 ± 6.7 and female participants 46.4 ± 8.9 , with no statistically significant difference between sexes ($t=2.276$, $df=168$, $p<0.05$). All veterans gave their informed consent to participate in the study. The study was approved by the Ethics Committee of the Split University Hospital Center.

Instruments

The symptoms of depression and sleep disturbance in veterans with PTSD and depressive patients were assessed by a psychologist using the Beck Depression Inventory¹⁴, Pittsburgh Sleep Quality Index¹⁵ and Epworth Sleepiness Scale¹⁶.

The Beck Depression Inventory consists of 21 items which assess the intensity and structure of the symptoms of depression in normal population and psychiatric patients. Each item consists of four statements ranged according to the level of expression and intensity of a depression symptom. The symptoms are classified by the DSM criteria. The questionnaire can discriminate mild, moderate and severe depression, with the reliability coefficient of 0.80. It contains 21 statements and each statement consists of four possible answers ranging from 0 (absence of symptom during the past two weeks) to 3 (symptom was present all

the time during the past two weeks). The maximum possible score is 63 and the score of 21 or higher in the general population is an indication of depression. For persons with the diagnosis of depression, a score of 0-9 indicates minimal depressive symptoms, 10-16 mild depression, 17-29 moderate depression, and 30-63 severe depression¹⁴.

The Pittsburgh Sleep Quality Index is an instrument developed to assess the quality and disturbances of sleep during a month. The questionnaire consists of 19 items grouped into 7 components that are evaluated: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. The instrument can distinguish 'good' from 'poor' sleepers with a sensitivity of 89.6% and specificity of 86.5%. Clinimetric and clinical properties of the Pittsburgh Sleep Quality Index suggest its utility both in psychiatric clinical practice and research activities. The first four variables use measure units that correspond to individual characteristics of sleeping (time of going to bed, time to fall asleep, time of getting up and duration of actual sleep), whereas other variables are assessed by the mean value on the modified Likert-type scale ranging from 1 to 4. The higher score on the individual variable, the more that variable contributes to poor quality of sleep¹⁵.

The Epworth Sleepiness Scale is an instrument developed to assess the level of daytime sleepiness and can be useful in the diagnosis of sleep disturbances. It consists of 8 items on a Likert-type scale ranging from 0 to 3. A total score of 0-9 is the average result in a normal population, and 10-24 indicates the level of disturbances that require treatment. The primary use of this instrument is assessment of obstructive sleep apnea. It is useful for assessing excessive daytime sleepiness and it is repeated after the treatment to evaluate the reduction of symptoms. In narcolepsy, the Epworth Sleepiness Scale has a high specificity (100%) and sensitivity (93.5%)¹⁶.

Statistical analysis

Variables were analyzed descriptively (age presented as mean and standard deviation, other variables as median and 25-75 percentiles). Differences between the variables of age and Beck Depression Inventory were tested using t-test. Mann-Whitney test was used to compare the groups on the items of the Pittsburgh

Sleep Quality Index and Epworth Sleepiness Scale. SPSS statistical software, version 16.0 (SPSS Inc., Chicago, IL, USA) was used on statistical analysis. The level of significance was set at $p < 0.05$.

Results

On the Beck Depression Inventory, the mean score \pm standard deviation was 30.0 ± 11.5 in PTSD patients and 26.8 ± 12.9 in patients with depression, with no statistically significant difference between the groups ($t = -1.601$, $df = 168$, $p = 0.164$).

On the Pittsburgh Sleep Quality Index, a statistically significant difference was found in the time to fall asleep ($p < 0.001$), time of getting up ($p < 0.001$) and duration of actual sleep ($p < 0.001$). Patients with PTSD needed more time to fall asleep, got up earlier and had a shorter duration of sleep than patients with depression. PTSD patients more frequently woke up during the night ($p = 0.001$), had breathing discomfort during sleep ($p < 0.001$), coughed or snored loudly ($p < 0.001$), felt too hot during sleep ($p = 0.016$), had bad dreams ($p < 0.001$) and other reasons contributing to poor quality of sleep ($p < 0.001$). Expectedly, the overall subjective quality of sleep was lower in PTSD patients than in patients with depression ($p = 0.001$). Sleepiness during the day was also more prominent among PTSD patients ($p = 0.011$), as well as the effect of sleep disturbances in the level of optimism ($p = 0.004$).

In both groups of patients, a low frequency of taking sleep medicine was found, with no significant difference between the groups ($p = 0.595$) (Table 1).

On the Epworth Sleepiness Scale, each variable was evaluated individually to assess the everyday situations, i.e. activities in which the patients tended to doze off. No statistically significant difference between the two patient groups was found in any of the variables analyzed. The patients in both groups reported that they most frequently dozed off while reading, watching TV or taking an afternoon nap, and the least frequently while riding a car, talking or waiting in traffic as a car driver (Table 2).

Discussion

This study showed significant differences in the self-assessment of sleep quality between war veterans with PTSD and civilians with depressive disorder, but

Table 1. Scores on the Pittsburgh Sleep Quality Index

Sleep characteristic	Pittsburgh sleep score (median: 25-75 percentile range)						p-value
	PTSD N=120			Depression N=50			
Time of going to bed	23	5	24	23	22	24	0.825
Time to fall asleep	60	30	70	30	15	45	<0.001
Time of getting up	6	5	7	7	6	8	<0.001
Duration of actual sleep	5	4	5	6	5	7	<0.001
Frequency of sleep disturbances	4	3	4	3	1	4	0.001
Waking up during the night	4	3	4	3	2	4	0.001
Using the bathroom	3	2	4	2	1	4	0.147
Breathing discomfort	3	1	4	1	1	2	<0.001
Coughing or loud snoring	3	1	4	1	1	2	<0.001
Feeling too cold	2	1	3	1	1	3	0.035
Feeling too hot	3	2	4	2	1	4	0.010
Having bad dreams	4	3	4	3	1	4	<0.001
Having pain	3	2	4	2	1	3	0.004
Other reasons for sleep disturbances	3	2	4	1	1	2	<0.001
Frequency of taking sleep medicine	3	2	4	4	1	4	0.595
Having trouble staying awake during the day	2	1	3	1	1	2	0.011
Effect on sleep disturbances on optimism	3	3	4	2	1	4	0.004
Overall quality of sleep	3	3	4	3	2	3	0.001

Table 2. Scores on the Epworth Sleepiness Scale

Chance of dozing in the following situation	Epworth score (median: 25-75 percentile range)						p-value
	PTSD N=120			Depression N=50			
Reading	2	1	3	2	1	3	0.802
Watching TV	2	2	4	3	2	4	0.156
Sitting in public	1	1	2	1	1	2	0.821
Riding in car	1	1	2	1	1	1	0.225
Afternoon nap	2	1	3	3	2	4	0.073
Talking	1	1	2	1	1	2	0.854
After lunch	1	1	2	2	1	3	0.204
Waiting in traffic	1	2	1	1	1	1	0.420

no statistically significant differences in the level of depressiveness and sleepiness.

Although below the level of statistical significance, it is evident, by the single item comparison, that depressive symptoms were more expressed in PTSD patients than in patients with depression. High scores on the Beck Depression Inventory among veterans in our study are not surprising, considering a high prevalence

of depression as a comorbid disorder in PTSD patients^{17,18}. It is difficult to ascertain whether the depressive disorder is a result of comorbidity, or the high scores on the Beck Depression Inventory arise from the symptomatology of PTSD. Among other common symptoms of PTSD are the loss of hope, the feeling of rejection, low self-esteem, suicidal tendencies, feeling of fatigue, loss of sexual drive, and the feeling of guilt.

The question arises whether the guilt, which underlies the genesis of PTSD and is complicated with grief, brings about a kind of depression that is of different quality than the one present in the depressive disorder¹⁹. Another possible explanation for the high scores on the Beck Depression Inventory among PTSD patients is their tendency to aggravate their subjective symptoms, usually to obtain or retain secondary benefits such as social or economic support. The use of other instruments for assessment of depressiveness could help in resolving these uncertainties.

Analysis of variables on the Pittsburgh Sleep Quality Index showed a significant difference between the groups in the quality of sleep. In comparison with patients with depression, PTSD patients went to sleep later, needed two times more time to fall asleep, got up earlier and their total duration of sleep was shorter. These findings are corresponding to the results of studies by other authors that showed more significant reductions in the quality of sleep among PTSD patients than in patients with depression, especially if depression occurred as a comorbidity of PTSD¹⁸. These findings fit well into the symptomatology of continuous overexcitation of PTSD patients as the cause of their poorer sleep quality²⁰. Findings in the group of PTSD patients are fully in accordance with the clinical picture of this disorder and point out exactly those characteristics of insomnia which differ in PTSD and depression: difficulties in falling asleep, more frequent waking up during the night, and nightmares are typical for PTSD patients, much more so than in patients with depression^{21,22}. Recent studies confirm the diagnostic value of nightmares, which are almost pathognomonic to PTSD¹⁰. Although a polysomnographic analysis would yield much more precise and valid results, it would be highly impractical in everyday practice.

An interesting finding of our study was that there was no significant between-group difference in the frequency of taking sleep medicine, as well as a relatively low rate of such medication among all participants. This may be an indication of poor compliance to therapy which is commonly prescribed for both PTSD and depression patients. A low rate of taking sleep medicine was associated with a poorer quality of sleep and more pronounced clinical picture in both groups of patients.

There was no significant between-group difference on any of the variables analyzed on the Epworth

Sleepiness Scale. Nevertheless, these results showed that both patients with PTSD and those with depression most frequently dozed off during reading, watching TV or taking an afternoon nap. Dozing off occurred least frequently during car rides, while talking to other people or waiting in traffic. It seems that the latter activities were arousing enough to keep the patients awake and concentrated. These results, however, are not in accordance with other studies on veterans, which found an increased level of sleepiness during car rides^{23,24}.

The limitation of this study was a relatively small sample which did not include PTSD patients without a depressive disorder. Furthermore, we used self-reporting instruments, which means that the assessment of depressiveness, sleep disturbances and sleepiness was unavoidably subjective.

Considering the fact that insomnia can occur as an early, covert sign of both PTSD and depression, and that there are some important differences in sleep disturbances between the two groups of patients, the use of these and similar instruments for the assessment of sleep quality can be useful in distinguishing patients with PTSD and depression, treatment of their sleep disturbances, and prevention of more severe clinical picture in both groups of patients.

Future research should include larger groups of participants and PTSD patients without depressiveness, as well as polysomnographic analysis which can more objectively assess sleep disturbances.

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Sažetak

USPOREDBA POTEŠKOĆA SPAVANJA IZMEĐU BOLESNIKA S POSTTRAUMATSKIM STRESNIM POREMEĆAJEM I DEPRESIVNIM POREMEĆAJEM

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Cilj istraživanja bio je istražiti razlike u stupnju depresivnosti, poteškoćama spavanja i pospanosti između bolesnika s posttraumatskim stresnim poremećajem (PTSP) i depresivnim poremećajem. U istraživanju je sudjelovalo ukupno 170 bolesnika, od kojih 120 s PTSP-om i 50 s depresivnim poremećajem. Primijenjen je Beckov inventar depresivnosti, Pittsburgh indeks kvalitete spavanja i Epworth ljestvica pospanosti. Rezultati su pokazali razlike u subjektivnoj procjeni kvalitete spavanja između bolesnika s PTSP-om i depresijom (bolesnici s PTSP-om su svoju kvalitetu spavanja procijenili lošijom), iako između dviju skupina nije bilo razlike u stupnju depresivnosti i pospanosti. Uzimajući u obzir da se nesanica može pojaviti kao rani, prikriveni znak PTSP-a i depresije te da su utvrđene razlike u intenzitetu smetnji spavanja između dviju skupina, uporaba ovih i sličnih instrumenata za procjenu kvalitete spavanja može biti korisna u razlikovanju bolesnika s PTSP-om i depresijom, liječenju poremećaja spavanja i prevenciji teže kliničke slike kod bolesnika s takvim psihijatrijskim smetnjama.

Ključne riječi: *Posttraumatski stresni poremećaj; Depresivni poremećaj; Spavanje, poremećaji*