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Sleep Medicine 4 (2003) 343–345

**SLEEP  
MEDICINE**

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Brief communication

## Sleep disorders and depressive feelings: a global survey with the Beck depression scale

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Received 21 October 2002; received in revised form 5 February 2003; accepted 7 February 2003

### Abstract

**Objectives:** Patients with (chronic) sleep disorders are prone to depression. Until now studies on the prevalence of depression in the various sleep disorders focused mainly on obstructive sleep apnea patients and narcolepsy. Studies in other common sleep disorders are scarce. The aim of our study was to estimate the prevalence of depressive feelings in the various sleep disorders diagnosed in a Center for Sleep and Wake Disorders.

**Methods:** We included 917 consecutive patients (age between 14 and 84 years, median age: 49, 396 male and 521 female), seen in our center for sleep and wake disorders during 2001 and first half of 2002. The diagnosis was based on the history taken at the outpatient-clinic and two consecutive 24-h polysomnographic recordings at home (APSG). The final decisions on the diagnosis were made according to the ASDA international classification of sleep disorders. The severity of depressive feelings was based on the Beck depression scale.

**Results:** Overall, the prevalence of depressive feelings was high. There were no significant differences in age and gender. In psychophysiological insomnia, inadequate sleep- and wake hygiene, sleep state misperception and periodic limb movement disorder/restless legs syndrome some form of depression occurred in more than half of the patients. Moderate to severe depression was found in 3.5% of the patients.

**Conclusion:** The study suggests that the use of a depression scale in the daily routine of diagnosing and treating sleep disorders should be encouraged in order to optimise diagnosis and therapy in these patients.

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*Keywords:* Sleep disorders; Depression

### 1. Introduction

Patients with (chronic) sleep disorders are prone to depression. In a large study of 500 narcoleptic patients 57% of the patients had some degree of depression [1]. In another study the authors found that 28.6% of narcoleptics and 26.1% of idiopathic hypersomnolence patients suffered from depression [2]. In a third study 20% of narcolepsy patients had suffered from depression somewhere in the course of their illness [3]. Therapy for daytime sleepiness had only little influence on depression [4].

In obstructive sleep apnea patients (OSAS) a significant correlation between the severity of depression and the number of apneas/hypopneas per hour of sleep was found [5]. Depression improves after a few months of CPAP use [6]. Other authors deny this [7].

In general 25% of patients who present to a sleep disorder clinic describe themselves as currently depressed and 60% report symptoms consistent with an episode of major depression within the last 5 years [4]. These authors suggested that the prevalence of mood disturbances is probably unique for each sleep disorder.

Depression and a sleep disorder in the same patient may be mere coincidence. However, there is often evidence for a causal relationship between depression and the sleep disorder or vice-versa.

Until now studies on the prevalence of depression in the various sleep disorders focused mainly on OSAS and narcolepsy. Studies in other common sleep disorders are scarce.

The aim of our study is to estimate the prevalence of depressive feelings in the various sleep disorders diagnosed in a Centre for Sleep and Wake Disorders.

The Beck depression scale [8] is commonly used in

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research on sleep and depression. There might be some doubt whether this scale provides the most current criteria for depression. However, we decided to use the scale for our survey. Obviously, this implies that we did not investigate the prevalence of the clinical syndrome of depression itself, but depressive feelings expressed in this scale. Furthermore, we thought the scale adequate because the population in the original study by Beck and ours do not differ in essential features.

## 2. Population

We included all consecutive patients seen in our centre for Sleep and Wake Disorders during 2001 and the first half of 2002. Two hundred patients were given antidepressants (often a low dose) by their general practitioner before coming to our centre. From this group of patients only those with clinically obvious, primary depression ( $N = 77$ ) were excluded from the study, as well as the approximately 50 patients for whom no final diagnosis was available. The remaining 917 patients (between 14 and 84 years; median age: 49; 396 male and 521 female) were included. In the 50 patients with no final diagnosis the overall prevalence of a Beck score greater than 10 was approximately similar to that in the study population of 917.

## 3. Method

The diagnosis was based on the history taken at the outpatient-clinic and two consecutive 24-h polysomnographic recordings at home (APSG). The final decisions on the diagnosis were made according to the ASDA international classification of sleep disorders [9] during our multidisciplinary clinical conferences.

The severity of depressive feelings was based on the

Beck depression scale [8]. This inventory comprises 21 questions, each with four possible answers (score: 0–3). If a symptom is more severe, the score will be higher. The higher the total score, the more depressed the patient.

The Beck scores are divided in six grades of depression, according to the original description of the scores:

- 0–9: no or minimal depression
- 10–14: on the border of a depression
- 15–20: mild depression
- 21–30: mild-moderate depression
- 31–40: moderate-severe depression
- 41–63: severe depression

The patients filled in the questionnaire between the first and second APSG.

## 4. Results

The prevalence of depressive feelings differentiated for the various sleep disorders is given in Table 1. Confidence limits were added for the larger groups of patients. The overall prevalence was high. Patients with psychophysiological insomnia, periodic limb movement disorder, inadequate sleep- and wake hygiene and sleep state misperception had a chance of 50% or higher to have some form of depression. Moderate to severe depression occurred in particular in patients with inadequate sleep- and wake hygiene, delayed sleep phase syndrome and sleep state misperception.

Overall, 47% of the men studied had a Beck score over 10, indicating some form of depression; 3.6% of the men had a moderate or severe depression (Beck score cut off at 31). In women similar figures were found. Moderate or severe depression was encountered in 3%; 55% of all

Table 1  
Prevalence of depressive feelings and total number of patients for each diagnosis<sup>a</sup>

Beck score = > Diagnosis:	Some form of depression: Score 10 or more (%)	Moderate-severe depression: Score 31 or more (%)	N =
Psychophysiological insomnia	60.5 (56–64)	1.4	148
Obstructive sleep apnea syndrome	41 (37–44)	1.6	167
Intrinsic sleep disorder not otherwise specified (always insomnia)	42.5 (37–47)	1.9	103
Narcolepsy	37 (28–46)	0	28
Periodic limb movement disorder/restless legs	53 (49–57)	2.4	154
Inadequate sleep- and wake hygiene	63 (58–67)	6.8	136
Delayed sleep phase syndrome	41 (33–48)	7.2	40
Snoring	31 (24–37)	2.8	51
Sleep state misperception	63 (56–69)	5.6	54
Parasomnia	29	0	10
Idiopathic hypersomnia	27.5	0	14
Hypnotic-dependent sleep disorder	100	0	4
Advanced sleep phase disorder	83	0	5
Alcohol-dependent sleep disorder	67	0	3

<sup>a</sup> In brackets: 95% confidence limits.

Table 2  
Averages, confidence limits and standard errors of Beck scores for the various diagnoses

Diagnosis:	Average	SE	CI 95%
Psychophysiological insomnia	11.66	0.55	10.58–12.75
Obstructive sleep apnea syndrome	10.01	0.59	8.85–11.16
Intrinsic sleep disorder not otherwise specified	10.77	0.84	9.10–12.43
Narcolepsy	8.83	1.05	6.67–10.98
Periodic limb movement disorder/restless legs	11.88	0.65	10.59–13.17
Inadequate sleep- and wake hygiene	14.24	0.78	12.69–15.78
Delayed sleep phase syndrome	12.95	1.59	9.74–16.16
Snoring	8.46	0.96	6.53–10.39
Sleep state misperception	13.07	1.00	11.07–15.07
Parasomnia	8.60	2.41	3.15–14.05
Idiopathic hypersomnia	6.21	1.13	3.76–8.67
Hypnotic-dependent sleep disorder	15.75	2.56	7.60–23.90
Advanced sleep phase disorder	13.17	3.26	4.79–21.55
Alcohol-dependent sleep disorder	11.60	2.01	6.01–17.19

women had some form of depression. There was no correlation between age and prevalence of depression.

For the details on the Beck scores for the various diagnoses, see Table 2. Statistical analysis of differences between the diagnosis categories was difficult, but a trend is seen in that patients with complaints about insomnia (psychophysiological insomnia, intrinsic sleep disorder NOS, sleep state misperception) have higher Beck scores than patients with disorders characterised by hypersomnia during daytime (OSAS, narcolepsy, idiopathic hypersomnia).

Patients with clinically overt depression were excluded from the study. None of the patients in the study group had a final diagnosis of sleep disorder due to depression. In other words the depressive feelings were secondary in all patients. One hundred and twenty three of the 917 patients studied already had antidepressant medication before entering the study (see description of the patients). As the Beck scores varied between 0 and 38 in these cases, we had to conclude that prescription was often questionable.

## 5. Discussion

Some diagnostic categories contained a small number of patients (parasomnia, idiopathic hypersomnia, hypnotic-dependent sleep disorder, advanced sleep phase syndrome and alcohol-dependent sleep disorder). This probably has an effect on the reliability of the percentage found in these categories. For the other diagnoses the groups were large enough to give an estimate of the prevalence of depressive feelings in these disorders. One should however realise that our results reflect a prevalence in patients with severe sleep disorders presenting themselves in a sleep centre. We can expect that in general practice the prevalence will be lower and severity of depression will be milder, but this was not part of our study. In comparison with the normal data from

the original description by Beck et al., which reflects the prevalence of depression in the general population, our figures were obviously higher in this group of patients visiting a sleep centre.

Our results are almost similar to those by Roth et al. for narcolepsy and idiopathic hypersomnia [2].

Surprisingly, 31% of the patients who only snored during the night had some form of depression. This figure is high, and only 10% less than that of OSAS patients.

In psychophysiological insomnia, inadequate sleep- and wake hygiene, sleep state misperception and periodic limb movement disorder/restless legs syndrome some form of depression occurred in more than half of the patients. (Small groups, such as hypnotic-dependent sleep disorder, alcohol-dependent sleep disorder and advanced sleep phase syndrome are not taken into account.) It is sometimes difficult to understand why these disorders persist despite adequate medication or behavioural and cognitive therapy. The reason, therefore, might be an underlying depression. Use of the Beck scale can give indication for concomitant mood disorder and thus for changes in therapy. The same holds true for the large group of patients with intrinsic sleep disorder NOS. Despite lack of clear clinical signs and symptoms of depression in these groups, the patients may benefit from antidepressant medication in case of higher Beck scores.

The study made us aware that the use of a depression scale in the daily routine of diagnosing and treating sleep disorders is useful for the detection of depressive feelings secondary to or associated with sleep disorders. We think that routine use of depression scales should be encouraged in order to optimise diagnosis and therapy in these patients.

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