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High prevalence of restless legs syndrome in somatoform pain disorder

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Abstract Patients with somatoform pain often complain of sleep disorders, but sleep disorders are not an integrated part of the diagnosis of this disorder. Restless legs syndrome is associated with painful symptoms and sleep disturbances. The aim of our study was to evaluate the prevalence of restless legs syndrome (RLS) in somatoform pain disorder. *Method* In this study 100 consecutive patients (mean age: 46.4; SD: 11.4; women: 58) diagnosed with somatoform pain disorder (SPD) were clinically investigated for the occurrence of RLS at the behavioral medicine clinic for pain outpatients in the department of psychiatry within the Medical University of Vienna. The pain parameters of SPD were assessed using a pain questionnaire and visual analogue scales (VAS). The severity of RLS was established using the questionnaire of the International Restless Legs Syndrome Study Group (IRLSSG). *Results* The prevalence of restless legs syndrome found in somatoform pain disorder was 42%. Interrupted sleep was found in 83.3% in somatoform pain disorder with comorbid RLS and in 64.1% in somatoform pain disorder without RLS. Patients with continuous somatoform pain had a significant higher occurrence of RLS (Sample: 55%; with RLS: 71.4% and without RLS: 43.1%). The pain parameters increased parallel to the severity of RLS. Additionally, RLS was associated with higher psychosocial disability in family life. *Conclusions* The prevalence of RLS is high in our sample of patients with somatoform pain disorder. There seems

to be a difference in pain profile between patients with and without RLS. RLS may increase the pain level and prolong pain in somatoform pain disorder. RLS should be considered when a somatoform pain disorder is diagnosed.

Key words somatoform pain disorder · chronic pain · sleep disorder · restless legs syndrome

Introduction

A considerable proportion of patients with somatoform pain disorder suffers from sleep disorders [1], and vice versa, patients with sleep disorders have an increased risk of developing somatoform symptoms [22]. To date it remains unclear whether the sleep disorder is secondary to a pre-existing somatoform disorder, whether it is itself an important factor in maintaining the pain disorder or whether it can be explained by common psychopathological pathways. However, the deprivation of deep sleep stages has been experimentally linked to muscle pain [15, 16]. This observation supports the hypothesis that sleep disturbances may play an important role in increasing and prolonging pain and fatigue. According to Gillespie et al. [9] sleep disturbance is one of the most important dimensions of somatoform disorders beside depression, somatic distress and phobic anxiety.

Restless legs syndrome (RLS) is a common sleep disorder, which was first described in the 17th century by Thomas Willis and summarized as a clinical entity in the 20th century by Ekbom [7]. The epidemiology of RLS remains controversial. The prevalence of RLS ranges from 2.5% [7] to 29% [17] in different populations. The prevalence of RLS in the general population ranges from 8 to 18% [23]. Rothdach et al. [21] found an RLS prevalence of about 10% in the general population. RLS is the fourth leading cause of

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insomnia, after psychiatric disorders, drug abuse, and sleep-related breathing disorders [6]. The International RLS Study Group (1995) established four minimal criteria for RLS: (1) desire to move the extremities often, associated with leg paresthesia/dysesthesia; (2) motor restlessness; (3) worsening of symptoms at rest, with at least temporary relief from activity, and (4) worsening of symptoms in the evening or during the night [30]. RLS is associated on the behavioral level with increased depression and anxiety scores [26] and reduced quality of life. Furthermore, EEG mappings have revealed findings characteristic of major depression [23].

The restless legs syndrome is known to be also associated with other chronic pain syndromes like fibromyalgia [4] and rheumatoid arthritis [20]. A sleep disorder seems to be an important factor in perpetuating chronic pain [1]. According to Schneider-Helmert et al. [25], insomnia in chronic pain is of the same type and degree as primary insomnia, should be taken seriously, and treated using the methods specific to primary insomnia. There are a lot of possible pathophysiological mechanisms, linking sleep disturbance to pain. Patients with multiple somatic complaints had less stage III and stage II sleep and more wakefulness. In addition, arousals were more frequent in the patients with somatoform symptoms; sleep latency was shorter but sleep efficiency was reduced in these patients compared to the controls [8]. Hyperarousal states and altered central nervous system information processing may be involved in somatization processes [10].

In light of these considerations, our study aimed to evaluate the prevalence of restless legs syndrome in somatoform pain disorder patients.

Method

One hundred patients with somatoform pain disorder (SPD) (DSM-IV) [2] were recruited consecutively from the behavioral medical pain clinic at the department of psychiatry in the Medical University of Vienna. For somatoform pain disorder to be diagnosed pain has to have been experienced for at least 6 months. Eighty-one percent of the patients reported pain duration of longer than 2 years. The mean age of the subjects was 46.4 years (range: 20–76 years; SD = 11.4) and 58% were women. Further socio-demographic variables are listed in Table 1. The study was approved by the institutional review board. After written informed consent was obtained, the patients underwent a complete neuropsychiatric examination including SCID (structured clinical interview for DSM-IV) [2], and an examination of their general medical history and their history of neurological/psychiatric diseases. The pain parameters of SPD were assessed using a pain questionnaire incorporating a visual analogue scale (VAS): maximum pain within the previous month, minimum pain within the previous month and medium pain within the previous month, and psychosocial disability within the previous month (occupation/work, leisure/social activities, family life/home responsibilities). VAS ranged between 0 (= minimum) and 10 (= maximum). Additionally, pain frequency and pain duration were assessed. All patients were screened for restless legs syndrome by psychiatrists

Table 1 Sample description: 100 patients with somatoform disorder with and without restless legs syndrome: age, sex, education, employment and family status

| | Sample <i>n</i> = 100 | With RLS <i>n</i> = 42 | Without RLS <i>n</i> = 58 | <i>P</i> |
|---------------------|--------------------------|---------------------------|------------------------------|----------|
| Age (year) | 46.4 ± 11.4 | 47.4 ± 10.5 | 45.7 ± 12.0 | n.s. |
| Sex (women %) | 58% | 45.2% | 67.2% | 0.021 |
| Primary school | 30% | 37.1% | 24.1% | n.s. |
| Secondary school | 53% | 50% | 55.2% | n.s. |
| College | 10% | 4.8% | 13.8% | n.s. |
| University | 7% | 7.1% | 6.9% | n.s. |
| Student | 1% | 0% | 1.7% | n.s. |
| Blue collar worker | 7% | 9.5% | 5.2% | n.s. |
| White collar worker | 19% | 14.3% | 22.4% | n.s. |
| Household | 7% | 4.8% | 8.6% | n.s. |
| Unemployed | 35% | 47.6% | 25.9% | n.s. |
| Retired | 26% | 21.4% | 29.3% | n.s. |
| Single | 17% | 9.5% | 22.5% | n.s. |
| Partnership | 60% | 66.7% | 48.3% | n.s. |
| Divorced | 21% | 16.7% | 24.1% | n.s. |
| Widowed | 2% | 2.4% | 1.7% | n.s. |

experienced in sleep medicine from the outpatient clinic for sleep disorders of the department of psychiatry in the Medical University of Vienna.

Restless legs syndrome was diagnosed as satisfying the classification criteria determined by the ICSD [3] and the International RLS Study Group [30]. The diagnosis of restless legs syndrome was clinically established, and the German version of the 10-question IRLSSG for subjective assessment of the global severity of RLS was administered (1–10 points = mild, 11–20 = moderate, 21–30 = severe, 31–40 = very severe) [11, 23]. Patients filled out the questionnaires before examination was performed. There are difficulties in distinguishing between somatoform symptomatology and mild RLS symptomatology. To minimize confounding effects patients with subsyndromal RLS symptomatology were not diagnosed with RLS.

Statistics

For data examination purposes, Analysis of Variance (ANOVA) was performed. The severity of restless legs syndrome was considered as the dependent variable, all other variables, such as age, sex, educational status, employment status, marital status, sleep parameters, pain parameters (duration, frequency, localization, minimal pain during previous month, medium pain during previous month and maximal pain during previous month) and psychosocial disability were considered as independent variables or factors. If the result of one way ANOVA showed statistical significance, the Student–Newman–Keuls test as post hoc test was applied. In order to examine the homogeneity of variances, the Levene test was performed. The level of significance was set at $P < 0.05$ for all tests.

Results

The prevalence of RLS in somatoform pain disorder was 42%. Sixteen patients exhibited moderate restless legs syndrome according to the IRLSSG, 15 severe RLS and 11 very severe RLS. The percentage of patients with somatoform pain duration longer than 2 years did not differ between groups (Sample 81%; with RLS: 78.6% vs. without RLS 82.8%). There was

no significant difference in age between the groups ($F = 0.411$; $P = 0.801$). There was a significant difference between men and women ($F = 3.025$; $P = 0.021$), with men having a higher percentage of RLS (Table 1). There were no significant differences in restless legs symptomatology, except for the frequency in men and women.

Interrupted sleep was a greater problem in patients with somatoform pain disorder with RLS than in the group without RLS syndrome (Sample 72%, with RLS: 83.3% vs. without RLS 64.1%), but the difference did not reach significance in the ANOVA. The proportion of patients with continuous somatoform pain was significantly higher in the restless leg group (Sample: 55%; with RLS: 71.4% and without RLS: 43.1%). The proportion of patients with pain durations of hours or shorter was higher in the group without RLS (Sample: 34%; with RLS 26.2% and without RLS 39.6%). These differences in pain-periods are significant ($F = 2.791$; $P = 0.031$). The more severe the restless leg symptomatology was, the longer the pain period tended to be (S–N–K: $P = 0.054$). Interestingly, it was not only during the night that the patients felt pain. The patients with RLS more often experienced constant pain for the whole day (Sample 62%; with RLS: 73.8% vs. without RLS: 53.4%).

The somatoform pain parameters (minimal pain, medium pain and maximal pain) increased with the restless leg symptomatology in the IRLSSG. Patients with moderate RLS symptomatology, severe symptomatology and very severe symptomatology differed significantly in their level of medium somatoform pain during the previous month ($F = 3.659$; $P = 0.008$) and, minimum somatoform pain during previous month ($F = 3.691$; $P = 0.008$) and tended to differ with regard to maximal somatoform pain during previous month ($F = 9.004$; $P = 0.098$). Patients with somatoform pain disorder and RLS reported pain in their extremities more often than those without RLS (83.3 vs. 60.3%). One hundred percent of those with severe RLS experienced their main somatoform pain in their extremities. RLS symptomatology affected psychosocial disability in family and social life. The patients with RLS differed significantly in psychosocial disability in their family life (RLS: 7.1 ± 3.3 vs. no RLS: 6.2 ± 2.5 ; $F = 2.648$; $P = 0.038$) but not in their social life (RLS: 7.6 ± 3.3 vs. no RLS: 6.2 ± 2.7 ; n.s.) or in their work (RLS: 6.3 ± 4.1 vs. no RLS: 6.4 ± 3.2 ; n.s.).

Discussion

The main result of our study is a high prevalence of RLS (42%) in our sample of patients with somatoform pain disorder (SPD). The prevalence of RLS in the population [18, 21, 23, 30] is far lower than in our sample. There are obviously limitations when comparing data from a clinical sample with population

based data. The prevalence observed in our study is even higher than in other clinical samples (e.g. that of Oboler et al. [17]). Consequently, one may conclude there is an increased prevalence of RLS in patients with somatoform pain disorder. Additionally, polysomnographic evaluation of sleep in somatoform pain disorder showed increased periodic leg movements compared to normal controls [19, 24].

Despite the fact that there is a higher prevalence of RLS in the elderly [23], in our sample there was no difference in age between the SPD-patients with and without RLS. In some studies a higher prevalence of RLS has been found in women [21, 28, 29], whereas in our sample there was a higher portion of men with RLS (Table 1).

SPD-patients with RLS experienced longer periods of continuous somatoform pain with consequent higher maximal, medium, and minimal pain, and lesser pain free time. Disability in family life, measured by VAS, was increased in the comorbid RLS group.

Restless legs syndrome seems to be not simply a sign of chronification in somatoform pain disorder. As this paper has already demonstrated, the proportion of patients with pain duration of longer than 2 years was almost equal in the SPD-patients with and without RLS.

Chronic pain has also been found in a substantial proportion of RLS patients [31].

Our study points to a possible connection between RLS and somatoform pain. There may be some common underlying factors on different levels.

One factor may be the disturbance of the monoaminergic system. During chronic pain, loss of monoaminergic tone resulting from glucocorticoid-induced monoamine depletion may lead to reduced descending inhibitory impulses to the spinal cord causing an intensification of pain sensation [5]. A monoaminergic dysfunction, especially of the dopaminergic system, is also thought to play a role in the pathophysiology of RLS [27]. As dopamine is a prerequisite for the synthesis of noradrenaline, treatment of RLS patients with dopaminergic agents may facilitate dopaminergic and noradrenergic neurotransmission. A normal level of norepinephrine may be necessary for opioid responsiveness, as a recent study on long-term effects of chronic noradrenergic depletion of the central nervous system showed a decreased effect of opioids on pain in rats [12]. Furthermore, opioids are known to have less-efficacy in the treatment of chronic somatoform pain.

Another factor may be sleep disturbances. There are a lot of pathophysiological mechanisms that link sleep disturbances to pain. Pathogenic mechanisms which link non-restorative sleep physiology to pain and fatigue may involve metabolic dysfunction of the brain with sleep-related alterations in immunological and neurotransmitter functions (serotonin, substance P, endorphins) [14]. There is a high prevalence of

sleep disturbance in somatoform pain disorder [1]. Arousals are more frequent in patients with somatoform symptoms [8]. RLS induced sleep disturbances, for example sleep fragmentation or light sleep, may be associated with less recreation in the SPD-patients with RLS.

As the regular intake of non-opioid analgetics in patients on antidepressants appears to be a major risk factor for RLS [13], it is not at all surprising that SPD-patients have an increased prevalence of RLS. The use of non-opioid analgetics in conjunction with antidepressant medication is common among SPD-patients. Nevertheless, prospective studies are needed to explore the causal relationship between RLS, SPD and the combination of medications mentioned above.

In conclusion, patients with somatoform pain disorder should be carefully diagnosed for RLS. There seems to be a substantial number of SPD-patients who suffer from both chronic pain and RLS. Further studies are warranted to highlight the common pathophysiological background of SPD and RLS.

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