



Insomnia in adult attention-deficit/hyperactivity disorder: A comparison with borderline personality disorder population in a clinical setting and control participants

Sébastien Weibel^{a,*}, Françoise Jermann^a, Luisa Weiner^b, Rosetta Nicastro^a, Stefano Ardu^c, Eleonore Pham^a, Roland Hasler^a, Alexandre Dayer^{a,d}, Paco Prada^a, Nader Perroud^{a,d}

^aService of psychiatric specialties, Department of mental Health and Psychiatry, University Hospital of Geneva, Geneva, Switzerland

^bDepartment of Psychiatry, Mental Health and Addictology, University Hospital of Strasbourg, Strasbourg, France

^cDepartment of Cariology and Endodontology, Treatment Plan Unit and Division of Operative Dentistry, Dental School, University of Geneva, Geneva, Switzerland

^dDepartment of Psychiatry, University of Geneva, Geneva, Switzerland

Abstract

Objectives: Many adults with attention-deficit/hyperactivity disorder (ADHD) report sleeping difficulties. The relationship between sleep and ADHD is poorly understood, and shows discrepancies between subjective and objective measures. In order to determine the specificity of sleep-associated symptoms in ADHD, subjective sleep assessments among ADHD adult patients were compared with control subjects and with individuals suffering from borderline personality disorder (BPD).

Methods: 129 outpatients with ADHD, 70 with BPD (including 17 patients with BPD and ADHD comorbidity), and 65 control participants were assessed for sleep quality, insomnia, and sleepiness, using the Pittsburgh Sleep Quality Index (PSQI), the Insomnia Severity Index (ISI), and the Epworth Sleepiness Scale (ESS).

Results: ADHD- and BPD-sufferers achieved higher insomnia and lower sleep quality scores than control subjects. Clinical groups did not differ in terms of sleep quality, although insomnia was more severe among BPD patients. Depression scores explained most of sleep symptoms, but even when controlling for depression, ADHD sufferers showed higher sleep latency. Inattentive symptoms were associated with somnolence, while hyperactive/impulsive symptoms were associated with insomnia and lower sleep efficiency.

Conclusion: Sleep-related symptoms associated with ADHD were partly explained by non-specific factors, especially depression symptoms. In a dimensional perspective, hyperactive and inattentive symptoms were associated with specific sleep symptoms.

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1. Introduction

Attention-deficit/hyperactivity disorder (ADHD) is a disorder that persists into adulthood in more than 60% of cases [1]. For those individuals, sleep problems, which are a major issue in childhood ADHD, persist into adolescence and adulthood. Several meta-analyses, using both subjective and objective measures, have shown the presence of sleep disturbances

among children with ADHD [2–4]. Compared with control subjects, young ADHD patients have increased difficulties with sleep onset, night awakenings, morning awakening, and daytime sleepiness. Their sleep architecture shows greater fragmentation, with higher apnea, hypopnea, and increased movement during sleep [3]. It is estimated that more than 70% to 80% of adults diagnosed with ADHD also suffer from sleeping difficulties [5,6]. Adult ADHD patients have trouble falling asleep [7–9] and a disrupted sleep maintenance [9–12], and find it hard to wake up in the mornings [8,12]. One of the most consistent findings is struggling to go to bed on time [8]; this has been associated with a stronger eveningness chronotype [13]. Sleep parameters, objectively measured by actimetry, partially confirm these observations. Sleep onset latency is longer, sleep is more fragmented, and wake-up time is delayed [7,8,13]. However, polysomnography showed inconsistent

* Corresponding author at: Services des Spécialités Psychiatriques, Hôpitaux Universitaires de Genève, 20b rue de Lausanne, 1201, Genève, Suisse.

E-mail address: weibelse@gmail.com (S. Weibel).

¹ Present address: Pôle de Psychiatrie, Santé Mentale et Addictologie, Hôpitaux Universitaires de Strasbourg, 1 place de l'Hôpital, 67,000 Strasbourg.

patterns of alteration, and sleep architecture did not seem impaired among adults with ADHD [14]. The most robust finding is significantly-increased nocturnal motor activity and enhanced arousal frequency associated with periodic leg movements [14,15].

The inconsistency between objective and subjective measurements, both among children and adults, raises the question of sleep disturbance specificities [4]. Philipsen et al. [14] view this discrepancy as a misinterpretation of sleep quality among individuals who suffer from ADHD. Although sleep disorders are supposedly linked to basic brain dysfunctions associated with ADHD, such as dopamine–norepinephrine deficits, orexin/hypocretin deficits or melatonin synthesis deficiency [16], it has also been suggested that they are also, in part, the consequence of psychological disturbances, such as anxiety, depression, and adjustment disorders [17,18].

Comorbidities are particularly frequent in adult ADHD, since they affect more than 80% of sufferers, and are associated with increased depression and personality disorders, particularly borderline personality disorder (BPD) [19–22]. Overall quality of life is diminished, due to difficulties affecting educational, vocational and interpersonal domains [23,24]. With regard to the effect of depression on sleep, Schredl et al. [9] found, in a sample of 120 adults meeting DSM-IV criteria for ADHD, that depressive symptoms were associated with insomnia and poor quality of sleep. However, most studies tried to eliminate the effect of depression by excluding comorbid patients [6] or by relying on regression analyses controlling for the level of current depression and anxiety [8]. Furthermore, depression was generally considered as a categorical entity, neglecting the dimensional aspect of depressive symptoms and sub-threshold depression.

Borderline personality disorder (BPD) shares several characteristics with ADHD. Both disorders show a long-lasting evolution, high frequency of comorbidities, a core feature of impulsivity, and emotional dysregulation [25]. Emotional dysregulation is the hallmark of BPD [26], and is now considered to be a main feature of ADHD [27,28]. Furthermore, comorbidity between ADHD and BPD is frequent, with around 20% of BPD with ADHD, and the same proportion of ADHD patients with full-syndromal BPD [22,29]. Sleep problems are also characteristic of individuals suffering from BPD [30–35]. Compared to controls, BPD patients reported overall significantly-reduced sleep quality, as well as significantly-decreased sleeping time, decreased sleep efficiency, feeling significantly more exhausted, and poorer evening moods [31]. They also reported more frequent sleep arousals and awakenings, longer periods spent awake, and more problems affecting overall sleep quality [34]. As for adult ADHD, objective sleep measurements showed no consistent specific abnormalities, and discrepancies between objective and subjective assessments are frequent. For instance, regarding the finding of shortened REM latency, which is associated with major depression [36], four studies replicated this finding among BPD patients compared with controls

[34,37–39]. However, other similar studies failed to find shortened REM latency among BPD patients compared with controls [31,40,41]. Asaad et al. [30] found a high similarity between the EEG sleep profiles of individuals suffering from depression and those suffering from BPD, although the changes were more significant among patients with depression. In a large community-based sample of 5692 participants, Selby [42] reported that symptoms of BPD were significantly related to sleep disturbance, but were also strongly linked to comorbid major depressive episodes. Other studies excluded patients with current depression [31,34]. It is therefore unclear, both in BPD and in adult ADHD, whether the sleep problems widely observed in unselected clinical populations are associated with depression. It is worth noting that few studies have compared sleep disorders between clinical populations sharing the same types of comorbidities and adjustment difficulties.

To our knowledge, there are no studies comparing sleep subjective assessments between ADHD and BPD sufferers. As similarities are observed between these two disorders, comparing the two populations might help understand the relationship between depressive, inattentive/hyperactive symptoms and sleep disturbances in these disorders.

This study compares subjective sleep and sleepiness assessments, respectively among two unselected clinical samples, carefully diagnosed with either ADHD or BPD, and a general population sample as control group. The aims are to make subjective sleep-related comparisons between patients and to identify sleep symptoms specific to ADHD patients. Secondly, the aim is to determine whether clinical symptoms, especially depressive and inattentive/hyperactive symptoms, can be used to predict sleep disturbances.

2. Methods

2.1. Population

Patients were recruited in a specialized center for diagnosis and outpatient treatment of adults suffering from ADHD and BPD at the University Hospitals of Geneva. All patients meeting the criteria for ADHD or BPD diagnosis underwent the assessment and were included if they completed it.

65 control subjects were recruited among students and teachers from the School of Dentistry at the University of Geneva.

The study was approved by the ethics committee of Geneva University Hospitals. Informed written consent was obtained from all participants.

2.2. Assessment

2.2.1. Patients

Patients underwent a clinical evaluation carried out by a trained psychiatrist (NP, PP or SW), to confirm the diagnosis of BPD and/or ADHD according to DSM-5 criteria, and to exclude any organic condition and/or Axis I disorders that might better explain the disorder. Psychiatric comorbidities were evaluated clinically. Current medication was assessed.

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