Sleep disorders in psychiatric practice

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Over the last years, a large body of evidence has accumulated showing that complaints of disordered sleep are quite prevalent in the community. Insomnia is by far the most common disturbance and is often associated with concurrent psychiatric illness, in particular anxiety and mood disorders. On the other hand, sleep complaints are frequently present among psychiatric patients and have been incorporated in the official diagnostic criteria for many mental disorders, such as major depression, post-traumatic stress disorder, generalized anxiety disorder and substance-related disorders. Estimates of the prevalence of sleep disorders diverge widely, because these disorders have been variously conceptualized. Currently, however, three different classifications for sleep disorders establish reliable diagnostic criteria and allow for more consistency in clinical research. In particular, the ICD-10 diagnostic criteria for insomnia helped to establish a consensus among sleep specialists by defining accurately this clinical condition, i.e. by conceptualizing it as the subjective complaint of insufficient or non-restorative sleep, which is the important feature, not the actual amount of time spent asleep. Alongside the evolution of taxonomic systems, the development of specific diagnostic tools, such as rating scales for measuring clinical manifestations of sleep disorders, has contributed significantly to the growth in the field. For instance, the risk factors responsible for the development of chronic insomnia, its consequences, and the complex relationship between insomnia and psychopathology, have been considerably clarified. In terms of the polysomnographic aberrations observed in various mental disorders, these, although proven not to be pathognomonic for any of them, have been considerably refined over the last decade, and certain general sleep patterns for some specific disorders have emerged. Finally, substantial advances have been made in the elucidation of the neuropsychobiological substrate of disturbed sleep. Thus, hyperarousal has been identified as the cardinal feature of chronic insomnia, which is associated with an around-the-clock activation of both major components of the stress system, the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system.

Key words: Sleep disorders, insomnia, psychopathology, polysomnography, neurobiology

A complaint of disordered sleep is quite common. Bixler et al (1) were among the first to carry out comprehensive epidemiological studies using a sample representative of the general population. They found that a current complaint of insomnia was reported by 32.2% of the respondents. In addition, 7.1% of the respondents suffered from excessive sleep, either current or past, 11.2% had a problem with nightmares and 2.5% reported having sleepwalking, either current or past.

Concurrent psychiatric diagnoses are common in individuals with sleep disturbances. In their 1989 study, Ford and Kamerow (2) demonstrated that 40% of respondents with insomnia and 46.5% of respondents with hypersomnia had a psychiatric disorder, compared with 16.4% of individuals with no sleep complaints. Anxiety disorders were found to be the most common mental disorders, in both insomnia and hypersomnia (23.9% and 27.6%, respectively). The prevalence of major depression, alcohol abuse or other substance abuse was also increased.

Insomnia has been found to be associated with psychiatric illness in two thirds of patients presenting at a sleep disorders center, and more than half of them had a mood disorder (3). In another study, insomnia related to psychiatric disorder was the most frequent diagnosis in patients referred because of insomnia to five sleep medicine centers (4).

Patients with sleep complaints are frequently seen in psychiatric practice. Insomnia is the most prevalent sleep disorder not only in the general population, but also among psychiatric patients. For instance, Berlin et al (5) found that, of 100 patients referred from a general hospital for psychiatric consultation, 72 had insomnia. In a study by McCall et al (6), 93% of depressed inpatients complained of insomnia. Disturbed sleep is a diagnostic criterion for many mental disorders, such as depressive episode, post-traumatic stress disorder (PTSD), generalized anxiety disorder and substance-related disorders (7-9).

DIAGNOSTIC ISSUES

As indicated above, one of three adults may report current trouble in falling or staying asleep or problem with waking up too early (1) but, when a more restrictive definition was used, the frequency of reported insomnia was in the range of 7.5 to 10.2% (2,10). Similarly, when sleep disturbances were required to last 2 weeks within the previous 6 months, to interfere with daytime functioning, and not to be related to a mental disorder or medical condition, the frequency of reported insomnia was only 3.2% (2). Therefore, a need to develop widely accepted diagnostic criteria is self-evident.

With the accumulation of knowledge over the years, insomnia has been variously conceptualized. To date, no definition has gained universal acceptance. ICD-10 defines the clinical condition of insomnia as follows: the complaint is either of difficulty falling asleep or maintaining sleep, or of poor quality of sleep; the disturbance has occurred at least three times per week for at least 1 month; the unsatisfactory quantity and/or quality of sleep either causes marked distress or interferes with ordinary activities in daily living. Thus, ICD-10 diagnostic criteria help to establish the threshold of significant sleep disturbance. It should be stressed that insomnia is a subjective complaint of insuffi-

cient or non-restorative sleep, and this complaint is important, not the actual amount of time spent asleep (11).

Needless to say, a universally accepted classification of sleep disorders would also increase diagnostic precision, improve comparability of epidemiological studies and provide greater homogeneity of research samples. Such a need has been long recognized. The first classification system was published in 1979 (12). Currently, three different classifications for sleep disorders are available: the revised edition of the International Classification of Sleep Disorders (ICSD, 13), the DSM-IV sleep disorders section and the section of ICD-10 dealing with non-organic sleep disorders.

The revised edition of the ICSD comprises 88 syndromes. They are divided into the following categories (13):
• Dyssomnias, i.e. the disorders of initiating and maintaining sleep and the disorders of excessive sleepiness.
• Parasomnias, i.e. undesirable phenomena that occur predominantly during sleep.
• Sleep disorders associated with mental, neurologic, or other medical disorders.
• Proposed sleep disorders.

The ICSD differs from other classifications also in that it includes polysomnographic diagnostic criteria.

The DSM-IV sleep disorders section (7) consists of:
• Primary sleep disorders, subdivided into dyssomnias and parasomnias.
• Sleep disorders related to another mental disorder.
• Other sleep disorders, e.g., sleep disorder due to a general medical condition and substance-induced sleep disorder.

In ICD-10, non-organic sleep disorders are listed with mental and behavioral disorders. The section of non-organic sleep disorders is divided into: a) dyssomnias, i.e. predominant disturbance in the amount, quality, or timing of sleep due to emotional causes (non-organic insomnia, non-organic hypersomnia, non-organic disorder of sleep-wake schedule), and b) parasomnias, i.e. abnormal episodic events occurring during sleep (sleepwalking, sleep terrors, nightmares). Non-psychogenic sleep disorders, such as narcolepsy or sleep apnoea, are placed in chapter 6 of ICD-10 (8).

The National Institute of Mental Health classification of insomnia (14) may be helpful in treatment planning. In this classification, insomnia has been divided into: a) transient insomnia lasting several days and related to minor situational stress; b) short-term insomnia lasting up to three weeks and associated with acute personal loss in work or family life, and c) long-term insomnia. It should be noted that both transient and short-term insomnia are physiological reactions occurring in normal sleepers, while long-term insomnia is a disorder of multiple causes.

ASSESSMENT METHODS

The development of specific diagnostic tools has contributed significantly to the growth in the field. For the past sixty years, polysomnography has been the main method of sleep analysis and the main diagnostic tool in sleep medicine. Standardized scoring systems for sleep stages had landmark significance, allowing to compare the results between laboratories. From the 1960s onwards, Rechtschaffen and Kales scoring criteria (15) have been the gold standard, despite the development of alternative methods of sleep description.

Altered sleep has to be regarded as a 24-hour disorder. Therefore, night-time recordings may be followed by daytime tests such as the Multiple Sleep Latency Test, a neurophysiological technique developed to quantify sleep tendency (16).

Rating scales for measuring clinical manifestations of sleep disorders have also been developed. Among many others, they include the Pittsburgh Sleep Quality Index (PSQI), designed to evaluate self-rated sleep quality (17); the Sleep Problems Scale (18); the Stanford Sleepiness Scale, the first tool developed to measure self-rated daytime hypersomnolence (19); and the Epworth Sleepiness Scale, employed to evaluate chronic excessive daytime sleepiness (20). Recently, the Athens Insomnia Scale, an instrument quantifying the severity of insomnia based on the ICD-10 criteria and consisting of either 8 items or only 5 items in the brief version, was produced (11,21,22). In addition, many other psychobiological measures can be utilized, since sleep medicine emerges from and depends upon a multidisciplinary approach.

INSOMNIA AND PSYCHOPATHOLOGY

"It is virtually axiomatic that a disturbance of the mind can manifest itself in the sleeping state as well as in the waking state" (23). A wealth of data on sleep in mental disorders has been accumulated to date. Clinical manifestations of chronic insomnia were thoroughly documented in a series of journal articles published in the 1970s and 1980s by Kales's group, which were integrated into a monograph on the evaluation and treatment of insomnia (24).

Insomnia is a condition of heterogeneous origin. Multiple diagnoses are the rule, not the exception. Stressful life events or stressors of everyday life are triggering factors, and maladaptive habits contribute to the development and persistence of insomnia. However, some predisposing factors, such as female gender (25) and family history of sleep disturbances (26), increase the vulnerability to insomnia. McCarren et al (27), using the Vietnam Era Registry, demonstrated that genetic effects were stronger predictors of self-reported insomnia than combat exposure.

For many years, insomnia has been viewed as a disorder of minor importance, although it was clear that insomniacs have poorer physical and mental health, and attempt suicide four times more often than controls (28). Prospective epidemiological studies consistently report that insomniacs are at greater risk for developing a depressive disorder. Ford and Kamerow (2) were the first to demonstrate that individuals who complained of insomnia at baseline and one

year later had a greater risk of developing new depression over the intervening year. Eaton et al (29) found that sleep problems identify 47% of the new cases of major depression occurring in the next year, and sleep problems are a better predictor of full-blown depression than thoughts of or wishes for death, feeling of worthlessness and guilt, psychomotor retardation, weight problems or fatigue. In the Breslau et al (30) study, insomniacs were at nearly four times higher risk for developing a new depressive disorder in the following 3.5 years. Data from epidemiological studies indicate that the risk for developing new anxiety disorders and alcohol abuse is also greater for insomniacs (2).

In a review of ten epidemiological studies on the association between heart disease and insomnia, Schwartz et al (31) concluded that sleep complaints are a marker for chronic stress which results in autonomic dysfunction and increased risk of myocardial infarction.

SLEEP ABERRATIONS IN PSYCHIATRIC DISORDERS

Descriptive data on sleep in depressive disorders are the best documented results in the field. Disturbed sleep during an acute depressive episode is characterized by decreased sleep continuity (increased sleep latency, multiple awakenings, early morning awakening), diminished slow wave sleep (stage 3 and 4), and shortened latency to the first rapid eye movement (REM) period, with an increased amount of REM sleep early in the first half of the night. However, 10-15% of depressive patients report hypersomnia, together with complaints of decreased energy and psychomotor retardation (for a review see 32). In mania, disturbed sleep continuity, shortened REM latency and greater REM density have been found (33).

Sleep abnormalities have been also documented in other psychiatric disorders, including schizophrenia, anxiety disorders, dementia and alcoholism. Prolonged sleep latency, decreased sleep continuity, decreased total sleep time, reduced slow wave sleep, decreased REM latency, reduced or increased REM sleep, increased REM density are the most often reported abnormalities in schizophrenia (for a review see 34). Sleep in generalized anxiety disorder is characterized by decreased depth and continuity (35). Lower sleep efficiency was demonstrated in outpatients with obsessive-compulsive disorder (36). DSM-IV and ICD-10 criteria for PTSD include nightmares and difficulty falling or staying asleep; however, objective sleep studies on PTSD revealed either no abnormalities or a variability of findings: reduced total sleep time, decreased sleep efficiency and delta sleep, reduced or increased REM latency and REM percentage, increased REM density (37). Slow wave sleep is reduced, and nocturnal waking is increased in patients with possible or probable Alzheimer's disease (38). A considerable reduction of slow wave sleep was found in abstinent alcoholics (39). Polysomnographic variables are not pathognomonic for any mental disorder (40), although general sleep patterns for specific disorders can be identified.

Automated EEG analysis may provide additional information. For instance, Ganguli et al (41) found less delta counts in schizophrenics while their slow wave sleep percent did not differ from that seen in controls.

Although polysomnography is the most widely used and the most sensitive state indicator of sleep, no diagnostic parameters have been found as yet. Therefore, two questions arise. First, what is the utility of psychiatric sleep research in a clinical setting and can it contribute to diagnostic classification, assessment of the course and prediction of the outcome? Second, can this research offer an insight into biological mechanisms of mental disorders?

Many data confirm that the clinical state, and the underlying pathology as well, can be mirrored in sleep variables. Disturbed sleep-wake patterns parallel cognitive decline in patients with possible or probable Alzheimer's disease (38). The amount of slow wave sleep appears to be inversely correlated with the presence of negative symptoms of schizophrenia (41). Slow wave sleep loss corresponds with cerebral atrophy in abstinent alcoholics (39).

Longitudinal follow-up and family studies suggest that sleep disturbances in depression are trait-like. Sleep of depressed patients in remission is still disturbed: delta sleep is decreased and REM latency is shortened. Shorter REM latency is associated with an increased risk for relapse (42). Polysomnographic studies in high risk probands showed that short REM latency and slow wave deficits are familial, and polysomnographic abnormalities may precede the clinical expression of depression (43). Relapsing primary alcoholics show significantly shorter REM latency and more REM percent compared with abstainers. Polysomnographic measures at time of hospital admission appeared to be a better predictor of relapse within 3 months than any other clinical or demographic variables (44).

Sleep disturbances may be of value in predicting suicide. A prospective study conducted in the general population demonstrated that the frequency of reported nightmares was related to the risk of suicide (45). Insomnia, hypersomnia and subjective sleep quality based on PSQI are related to suicidal behavior (46). Major depressive patients with nightmares at least twice a week have higher suicide scale scores (47). Suicide attempters have longer sleep latency, fewer late-night delta counts, and longer REM time (48).

Sleep data may also help in prediction of the PTSD course. Koren et al (49) reported that sleep complaints from 1 month after the trauma are significant in predicting PTSD after 1 year. Mellman et al (50) demonstrated that more fragmented REM pattern within a month of injury is associated with PTSD development.

THE NEUROPSYCHOBIOLOGICAL SUBSTRATE OF DISTURBED SLEEP

Considerable advances have been made in the elucidation of mechanisms underlying sleep disorders. Hyperarousal has been identified as the cardinal feature of insom-

nia (51). Chronic insomnia is associated with an around-the-clock activation of both major components of the stress system, the hypothalamic-pituitary-adrenal axis and the sympathetic system. The 24-h urinary free cortisol and catecholamine metabolites are significantly higher in insomniacs and correlate with objective sleep disturbances (52). Many additional measures suggest arousal due to augmented activity of the sympathetic nervous system: worse sleep maintenance, increased basal metabolic rates, altered heart rate variability, increased body temperature (for a review see 53). It has been proposed that the chronic activation of the stress system plays a significant role in the poor mental and physical health associated with persistent insomnia (31,52).

In the stress-diathesis model of mood and anxiety disorders, abnormal corticotropin releasing factor (CRF) regulation is responsible for such behavioral responses as arousal, restlessness and insomnia (54). Richardson and Roth (53) indicated that primary insomnia has an extensive overlap with major depressive disorder, suggesting commonality in pathophysiology. This has led to the hypothesis that increased activity of CRF neurons is responsible for primary insomnia. However, the CRF-producing neurons of the hypothalamus are only the final integrator which transforms the stress response into the endocrine response. It has been proposed that stressors requiring interpretation and modulation by previous experience may be relayed to paraventricular nucleus through multisynaptic limbic-forebrain circuits (55).

FUTURE DIRECTIONS

Many issues remain to be addressed in the field of sleep disorders. The incorporation of sleep medicine into the curricula of medical schools and residency programs is badly needed. Most studies concentrate on sleep disturbances in depressive disorder and non-organic insomnia. Interest in studies on sleep in schizophrenia is waning; yet, sleep disturbances in this disorder are well documented. Fewer studies focus on altered sleep in anxiety disorders. There are also unmapped territories. For instance, daytime complaints of impaired functioning are a precondition for the diagnosis of insomnia, but performance decrements in insomniacs remain a subject of controversy. Relatively little is known about the safety and efficacy of chronic hypnotic use. There is a strong evidence that insomniacs are at higher risk for depressive disorder, but whether early treatment of insomnia prevents the onset of depression, a question posed in the Ford and Kamerow (2) seminal study, still remains unknown.

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