Assessment of Excessive Sleepiness and Insomnia as They Relate to Circadian Rhythm Sleep Disorders

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Sleep disturbances are associated with a number of psychiatric disorders, including depression, anxiety disorders, and substance use disorders, and many psychiatric patients report symptoms such as insomnia, tiredness, fatigue, and excessive sleepiness. Despite their known negative impact on daytime functioning and quality of life, less than 10% of individuals with these symptoms visit physicians specifically for their sleeping problems. Although there are many explanations for this lack of reporting, one possibility is that individuals are often unaware of the impact of sleepiness on their daytime functioning. Therefore, the burden of identifying sleepiness and its consequences often resides with physicians and other health care professionals. This process of detection is assisted by rating scales and subjective and objective tests. Although prior discussions on these topics have focused on the understanding and identification of either excessive sleepiness or insomnia, these symptoms often coexist, introducing a clinical challenge in that it becomes unclear which of these two should become the initial focus of clinical attention. When both excessive sleepiness and insomnia coexist, a circadian rhythm sleep disorder may be present, such as jet lag type, delayed and advanced sleep phase types, and shift work type.
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The prevalence of excessive sleepiness and disturbed sleep among patients with psychiatric disorders is quite high. In a study by Sweetwood et al.,[1] the prevalence of trouble with falling asleep, waking up early, staying asleep, sleeping too much, napping during the day, sleep loss, and excessive sleep was 58% among male psychiatric outpatients versus 21% among nonpatient controls (Table 1). Additionally, of almost 1900 depressed participants in a European study of depression,[2] 73% reported tiredness and 63% reported sleep problems during the previous 6 months. Conversely, individuals with sleep disturbances are known to suffer from a high rate of psychiatric disorders, including depression, anxiety disorders, and substance use disorders.[3]

Excessive sleepiness and insomnia are associated with considerable impairment. For example, excessive sleepiness is linked to slower response time, instability of attention, rapid deterioration of performance, and cognitive slowing.[4] Consequently, excessive sleepiness is associated with a high rate of motor vehicle accidents[5] and accidents at the workplace.[6] Excessive sleepiness negatively affects memory (both short-term recall and working memory) and diminishes learning by hindering acquisition of new data. Sleepiness also makes it more difficult for individuals to understand what is essential and nonessential in their daily tasks.[6,7] The nature of impairments associated with insomnia is less clear, although some impairments noted in primary insomniacs include diminution of short-term memory and letter-finding ability.[8]

Because disturbed sleep appears to be so common in psychiatric patients and has such a profound impact on their lives, the recognition of these symptoms is of paramount importance. However, both excessive sleepiness and insomnia seem to be underreported in psychiatric and other medical practices. Very few patients with sleep disorders visit physicians specifically for their sleeping difficulties. Most patients who report insomnia in medical practices do so as a second- or third-line complaint; therefore, patients with excessive sleepiness often go unrecognized in psychiatric practices.[9] This lack of recognition is partly due to the fact that the patients themselves may not be aware that they are falling asleep during the day. Rosenthal et al.[10] studied patients' detection of brief daytime sleep episodes. Twenty patients were allowed to take naps of 1, 5, 10, and 20 minutes' duration. After the 1-minute nap, only 3 participants (15%) were aware that they had slept, while, of those napping for a full 20 minutes, only 14 participants (70%) were aware that they had slept (Figure 1). Diminished cortical function is associated with many disorders of sleepiness, which may make

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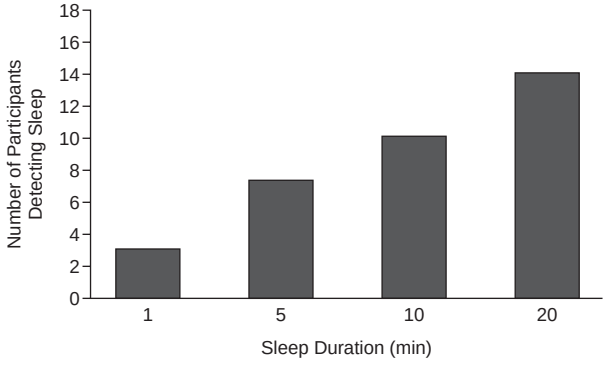
Table 1. Frequency of Sleep Disturbances in Male Psychiatric Inpatients and Nonpatients Over 18 Months[a]

	Patients (N = 103)		Nonpatients (N = 85)	
Sleep Disturbance	Mean %	SD	Mean %	SD
Trouble with:				
Falling asleep	29.5	5.8	6.8	2.8
Waking up early	38.3	4.6	11.3	2.4
Staying asleep	29.1	5.6	5.1	1.3
Sleeping too much	15.1	1.7	3.3	1.6
Napping during the day	17.4	5.4	3.5	1.6
Sleep loss	51.4	6.6	16.5	3.8
Excessive sleep	6.5	2.7	4.1	1.1
Overall sleep disturbance	58.0	6.8	20.6	4.2

[a]Data from Sweetwood et al.[1]

Figure 1. Participants (N = 20) Accurately Detecting Sleep After Nap Periods of 1, 5, 10, and 20 Minutes[a]



[a]Reprinted with permission from Rosenthal et al.[10]

Table 2. Hamilton Rating Scale for Depression Retardation Factor Score Items[a]

Factor Item	Scoring Criteria
Depressed mood (sad, helpless, hopeless, worthless)	0 = absent 1 = these feeling states indicated only on questioning 2 = these feeling states spontaneously reported verbally 3 = communicates feeling states nonverbally, ie, through facial expression, posture, voice, tendency to weep 4 = patient reports virtually only these feeling states in spontaneous verbal and nonverbal communication
Impaired work and activities	0 = no difficulty 1 = thoughts and feelings of incapacity, fatigue, or weakness related to activities, work, or hobbies 2 = loss of interest in activities, hobbies, or work—either directly reported by patient or indirectly by listlessness, indecision, and vacillation (feels that he or she has to push self to work or activities) 3 = decrease in actual time spent in activities or decrease in productivity 4 = stopped working because of present illness
Psychomotor retardation (slowness of thought and speech, impaired concentration, decreased motor activity)	0 = normal speech and thought 1 = slight retardation at interview 2 = obvious retardation at interview 3 = interview difficult 4 = complete stupor
Genital symptoms (decreased libido, impaired sexual performance, menstrual disturbances)	0 = absent 1 = mild 2 = severe

[a]Based on Hamilton.[11]

the recognition of internal states such as sleepiness more difficult for patients with excessive sleepiness. Additionally, many of these patients have suffered with these conditions for long periods of time and may begin to wrongly believe that sleepiness and fatigue represent their "normal" baseline state. Therefore, it is the physician's responsibility to be diligent in exploring the symptoms of sleep disorders and to make an accurate diagnosis.

DETECTION AND QUANTIFICATION OF EXCESSIVE SLEEPINESS AND INSOMNIA

Excessive Sleepiness

Psychiatric patients report a plethora of complaints regarding daytime energy levels in addition to excessive sleepiness. Strictly speaking, the primary manifestation of excessive sleepiness is the tendency to fall asleep during one's wake time hours. However, many psychiatric patients are afflicted by an impairment in energy levels (anergy) and fatigue, and yet may not, and do not, have a high propensity to fall asleep.

A number of scales can be used in a psychiatric setting to help identify excessive sleepiness. The retardation factor score of the Hamilton Rating Scale for Depression (HAM-D)[11] assesses degree of retardation or anergy in psychiatric patients by evaluating depressed mood, impaired work and activities, psychomotor retardation, and general symptoms as a cluster score (Table 2). The fatigue/inertia subscale of the Profile of Mood States[12] and the revised Clinical Interview Schedule[13] are other scales commonly used to evaluate fatigue in patients with various levels of sleepiness. A scale for the assessment of fatigue that is frequently used in multiple sclerosis and chronic fatigue syndrome is the Fatigue Severity Scale[14] (Table 3).

One subjective tool that was often used for determining excessive sleepiness in the past was the Stanford Sleepiness Scale,[15] which assesses the degree of sleepiness on a scale of 1 to 7 according to the patient's perception, with 1 being most alert ("feeling active, vital, alert, or wide awake") and 7 being the least alert ("no longer fighting sleep, sleep onset soon; having dreamlike thoughts"). However, this scale may not be very accurate

Table 3. Fatigue Severity Scale[a]

During the past week, I have found that:	Disagree						Agree
1. My motivation is lower when I am fatigued	1	2	3	4	5	6	7
2. Exercise brings on my fatigue	1	2	3	4	5	6	7
3. I am easily fatigued	1	2	3	4	5	6	7
4. Fatigue interferes with my physical functioning	1	2	3	4	5	6	7
5. Fatigue causes frequent problems for me	1	2	3	4	5	6	7
6. My fatigue prevents sustained physical functioning	1	2	3	4	5	6	7
7. Fatigue interferes with carrying out certain duties and responsibilities	1	2	3	4	5	6	7
8. Fatigue is among my 3 most disabling symptoms	1	2	3	4	5	6	7
9. Fatigue interferes with my work, family, or social life	1	2	3	4	5	6	7

[a]Adapted with permission from Krupp et al.[14] A mean score ≥ 4 indicates severe fatigue. A change in mean score of 0.5 is clinically significant.

Table 4. Epworth Sleepiness Scale[a]

Situation	Chance of Dozing (0–3)[b]			
Sitting and reading	0	1	2	3
Watching television	0	1	2	3
Sitting inactive in a public place—for example, a theater or meeting	0	1	2	3
As a passenger in a car for an hour without a break	0	1	2	3
Lying down to rest in the afternoon	0	1	2	3
Sitting and talking to someone	0	1	2	3
Sitting quietly after lunch (when you've had no alcohol)	0	1	2	3
In a car, while stopped in traffic	0	1	2	3

[a]Reprinted with permission from Johns.[16] A total score ≥ 10 indicates possible excessive daytime sleepiness or a sleep disorder.
[b]0 = would never doze, 1 = slight chance of dozing, 2 = moderate chance of dozing, 3 = high chance of dozing.

Table 5. Questions to Ask Patients to Determine the Pattern and Nature of Insomnia

How long does it take you to fall asleep?
How many awakenings do you have during the course of the night?
Do you wake up earlier than you desire?
After awakening, do you stay awake for the rest of the bedtime hours?

because, as Rosenthal and colleagues[10] pointed out, many patients are not aware of their own level of sleepiness. Therefore, the Epworth Sleepiness Scale (ESS)[16] was developed. The ESS is a self-rated test that assesses the patient's likelihood of falling asleep during the course of the day in normal, everyday situations. A total score of 10 or more indicates a high degree of sleepiness, and the patient is advised to seek the counsel of a physician to determine the cause of the excessive sleepiness (Table 4).

A number of objective tests have also been developed to assess the severity of excessive sleepiness. These tests are probably more sensitive and more efficacious than subjective tools in evaluating excessive daytime sleepiness and are often used in specialized settings such as sleep disorder clinics. One of the most commonly used objective tests is the Multiple Sleep Latency Test (MSLT),[17] in which patients are asked not to resist the urge to fall asleep during 5 nap opportunities during the course of the day. These nap tests typically occur at 10 a.m., noon, 2 p.m., 4 p.m., and 6 p.m. The MSLT relies on the presumption that the speed of falling asleep during the day is inversely proportional to the degree of daytime alertness, so a patient who falls asleep in 2 or 3 minutes is thought to be much more sleepy than a patient who falls asleep in 10 or 20 minutes.

A sleep latency of 10 to 20 minutes on the MSLT is considered normal, while a sleep latency of 6 to 10 minutes is considered borderline and is thought to indicate a possible sleep-wake disturbance. A sleep latency of 5 minutes or less is thought to indicate a pathologic level of sleepiness. At this degree of sleepiness, individuals cannot resist the urge to fall asleep and often do not have a premonition of the fact that they are sleepy, which makes them vulnerable to sleep attacks, i.e., falling sleep in dangerous situations.

A variant of the MSLT is the Maintenance of Wakefulness Test (MWT).[18] The conditions of the MWT are similar to those of the MSLT, except that individuals are asked to stay awake during the nap subsets. This test may be more directly proportional to the level of wakefulness during everyday situations because patients are asked to remain awake instead of being directed to fall asleep.

Insomnia

Scales have also been developed to assess the severity and course of insomnia. The HAM-D contains 3 separate questions that solicit information about early insomnia (ease of falling asleep when sleep is desired), middle insomnia (waking from sleep during the desired sleep period), and late insomnia (waking from sleep early). The Pittsburgh Sleep Quality Index[19] was designed specifically for use with psychiatric patients. It is a 19-item self-rated questionnaire that differentiates between "good" and "poor" sleepers and includes questions about sleep latency, duration, and efficiency.

Other tools for evaluating insomnia are sleep logs and interviews. Sleep logs are also commonly used to identify patterns in sleep and wakefulness during the course of a 24-hour period of time and to assess how these patterns might change across the course of weeks. During the office visit, the patient's pattern of insomnia can be understood by systematically asking questions about sleep

Table 6. Factors Associated With Excessive Sleepiness and Insomnia[a]

Excessive sleepiness
Shift work
Acute or cumulative sleep deprivation
Sleep apnea syndrome
Narcolepsy
Circadian rhythm sleep disorders
Medical and neurologic conditions
Drugs and medications
Depression
Insomnia
Adjustment sleep disorder
Psychophysiologic insomnia
Inadequate sleep hygiene
Depression and anxiety disorders
Circadian rhythm sleep disorders
Medical and neurologic conditions
Drugs and medications
Restless legs syndrome and periodic limb movement disorder

[a]Adapted from Doghramji.[20]

(Table 5). Patients being examined for insomnia should also be asked about the quality of their sleep. Some patients will sleep for 8 hours but wake up feeling that sleep was qualitatively impaired. Additionally, an interview with the bed partner is essential in all patients in whom a sleep disorder is suspected. Bed partners may be much more aware of the patient's sleep being disturbed or of the patient's falling asleep during the course of the day—especially in dangerous situations—than the patient is.

Prior to commencing management of excessive sleepiness and insomnia, physicians often face a dilemma as to which condition to address first. Additionally, it is often unclear whether the two conditions are causally related, or whether they are epiphenomenologically related to a third underlying condition. Certainly, if excessive sleepiness is so severe that it poses an immediate risk, such as falling asleep while driving, then it should be the immediate focus of clinical attention. If the physician is unclear which sleep complaint to treat first, however, it may be wisest to solicit the patient's feedback regarding whether the excessive sleepiness or the insomnia is his or her most immediate concern. If treatment of the condition of immediate concern does not ameliorate the other, then further diagnostic evaluation and treatment of the other condition should follow.

DIFFERENTIAL DIAGNOSIS OF EXCESSIVE SLEEPINESS AND INSOMNIA

The differential diagnosis of a sleep disorder in patients with psychiatric disorders is often challenging. A number of psychiatric disorders include excessive sleepiness and insomnia as symptoms (Table 6).[20] The effects of many medications that are given to treat psychiatric disorders can cause excessive sleepiness and/or insomnia, as can other prescribed medications and drugs taken recreationally by patients. Circadian rhythm disorders are also associated with both excessive sleepiness and insomnia.

CIRCADIAN RHYTHM SLEEP DISORDERS

The DSM-IV circadian rhythm sleep disorders are common causes of coexistent excessive sleepiness and insomnia. They include jet lag type, delayed and advanced sleep phase types, and shift work type. (In the International Classification of Sleep Disorders, these circadian rhythm sleep disorders are known as time zone change [jet lag] syndrome, delayed- and advanced-sleep phase syndromes, and shift work sleep disorder.)

Jet Lag Type

The jet lag type of circadian rhythm sleep disorder causes distress to many travelers, especially those who cross several time zones in a single trip. Frequent business travelers and others who must travel often can experience impaired performance and disruptions in the sleep cycle.

Delayed Sleep Phase Type

One of the more commonly seen circadian rhythm sleep disorders is delayed sleep phase type. This disorder, which typically afflicts adolescents and younger individuals, is characterized by a delay in bedtime such that the individual may not be able to fall asleep until 2 a.m. or 4 a.m. and may not be able to wake up until late in the course of the day. This syndrome is thought to be linked to a maturational delay in some of the clock mechanisms in the brain, and many individuals outgrow the delayed sleep phase syndrome later in life.

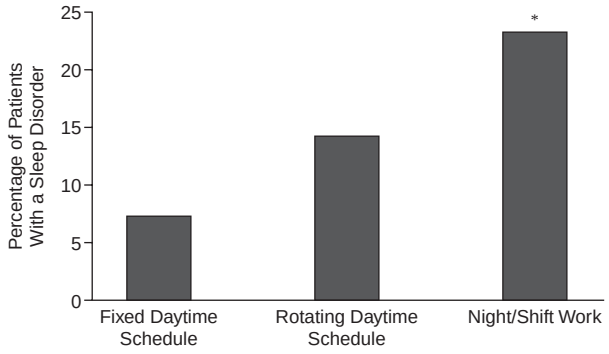
Advanced Sleep Phase Type

Advanced sleep phase circadian rhythm sleep disorder is similar to the delayed sleep phase type except that bedtime is advanced rather than delayed, i.e., individuals have trouble staying awake at night and wake up early in the day. Advanced sleep phase is more commonly seen in older adults than in younger persons and may be linked to age-related changes in the circadian rhythm.

Shift Work Type

Another important type of circadian rhythm sleep disorder is shift work type. Individuals who work variable or night shifts often change their bedtimes from one day to the next to accommodate their work and social schedules. In shift work type, the patient's body is unable to adapt properly to these changes, and individuals complain of both sleepiness and insomnia. In one study,[21] approximately 23% of participants who performed shift work had a circadian rhythm sleep disorder, significantly more than those who worked a fixed daytime schedule (Figure 2). Shift workers can be afflicted with a number of psychological and psychiatric symptoms including depression,

Figure 2. Circadian Rhythm Sleep Disorder by Work Schedule[a]



[a]Adapted with permission from Ohayon et al.[21]
*p < .01 compared with the fixed daytime schedule group.

malaise, diminished motivation, and impaired concentration[22] and with medical symptoms such as gastrointestinal difficulties and other health problems.[23]

As the number of people who perform shift work grows,[22] so does the number of patients with shift work–related sleep disorders. However, most people who do shift work simply have a shift work sleep pattern, not a sleep disorder. A diagnosis of circadian rhythm sleep disorder, shift work type, should be made when the disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

A number of factors predispose people to develop a shift work sleep disorder. The first of these is age. As people age, they are less likely to be able to adapt to changes in work shifts and sleep rhythms. The second is the existence of underlying sleep disorders, such as sleep apnea and narcolepsy. The prevalence of sleep apnea symptoms has been reported to be high in populations who do shift work, such as bus drivers.[24] The third factor is the way that the patient attempts to adapt to shift work. Habits that people often develop to deal with shift work, such as the consumption of caffeinated beverages to stay awake or alcohol to induce sleep and napping at the wrong time during the day, actually make the effects of shift work even worse and eventually lead to a true sleep disorder. The fourth factor is the direction in which people shift their rhythms to adapt to shift work. Clockwise shifts are often more easily tolerated than counterclockwise shifts.[25,26] Also, shifts differing more than 3 hours from one day to the next are often more difficult for people to adjust to than shifts differing 1 or 2 hours from one day to the next. Rotating shifts are probably much more devastating for individuals than straight shifts, although people who have straight night shifts often rotate their sleep times in response to times on and off duty and the need for daytime social scheduling.

CONCLUSION

In summary, excessive sleepiness and insomnia are common symptoms in psychiatric patients. Although sleep disturbances often have a high negative impact on patients' lives, they are underrecognized by both psychiatrists and patients. Psychiatrists should watch their patients for symptoms of sleep disturbances. A number of subjective and objective measures are available to identify excessive sleepiness and insomnia in clinical practice. Circadian rhythm sleep disorders such as delayed sleep phase type and shift work type may be present in patients with psychiatric disorders. Sleep disturbances can be managed with treatment.

Disclosure of off-label usage: The author has determined that, to the best of his knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

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