

Sleep disorders – a doctor's nightmare

Sleep disorders are common and can potentially be dangerous.

Insomnia is the most common, and often frustrating, sleep-related complaint doctors have to deal with. Up to one-third of the population suffers from a sleep disorder at some time in their life. Insomnia can be a primary problem, or it can be secondary to medical or psychiatric disorders or to medications and drugs of abuse. Insomnia can also be caused by psychophysiological factors such as jet lag. Sedative-hypnotic drugs are often prescribed for the treatment of insomnia. It is, however, necessary to understand the differential diagnosis of insomnia before treating it symptomatically as symptomatic treatment often removes the impetus to diagnose and relieve underlying causes. Treating the primary condition often relieves the insomnia, and symptomatic treatment can be avoided. It is therefore important to make an appropriate diagnosis and ask a few screening questions to all patients complaining of insomnia, poor quality of sleep or excessive daytime sleepiness. Screening questions in combination with a physical work-up and sleep laboratory studies, when indicated, should enable the clinician to refine the diagnosis to a specific sleep disorder and to plan an appropriate management strategy. Treatment options include behaviour changes, addressing underlying stressors, and pharmacological interventions.

DEFINITIONS RELATING TO INSOMNIA

According to the *Diagnostic and Statistical Manual of Mental Disorders IV (DSM IV)*, insomnia is associated with complaints about the quantity, quality or timing of sleep. Insomnia should be present at least 3 times a week over a period of at least one month. Patients can complain either

of difficulty in initiating or maintaining sleep, or of non-restorative sleep. Physicians often judge sleep according to duration alone, while ignoring the sleep quality.

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CLASSIFICATION AND DIFFERENTIAL DIAGNOSIS OF SLEEP DISORDERS

DSM IV classifies sleep disorders into three categories:

- primary sleep disorders
- sleep disorders related to other mental disorders
- sleep disorders related to general medical conditions or substances.

Primary sleep disorders are presumed to arise from endogenous abnormalities in sleep-wake generating or timing mechanisms, often complicated by factors of conditioning.

The International Classification of Sleep Disorders (ICSD) (Table I) is, however, the most advanced nosology available. The dyssomnias are disorders of sleep and wakefulness, whereby sufferers have difficulty in initiating or maintaining sleep, or may sleep excessively. The parasomnias are disorders of transition from one sleep stage to another, arousal, or partial arousal. General medical psychiatric disorders are not primarily disorders of sleep, but are frequently associated with

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it. Medical-psychiatric disorders and drugs associated with sleep problems are summarised in Table II. Parasomnias are mentioned only briefly as these patients do not normally present with complaints of insomnia, poor quality of sleep or somnolence.

DYSSOMNIAS

Intrinsic sleep disorders

These disorders originate within or are caused by some conditions in the body. However, they exclude general mental and medical conditions such as major depression, chronic pain and gastro-oesophageal reflux which are classified under a separate heading in the ICSD. Drug-related sleep disorders are classified under dyssomnias as extrinsic sleep disorders.

Psychophysiological insomnia

Psychophysiological insomnia is the most common sleep disorder, and the sleep disorder in the ICSD that most closely resembles the

DSM III category of primary insomnia. The onset is usually associated with tension and frequently follows an adjustment sleep disorder precipitated by stres-

sors (see 'Adjustment sleep disorder' below). The patient complains of difficulty in initiating and maintaining sleep or of non-restorative sleep for at least one month.

Table I. The International Classification of Sleep Disorders (ICSD)

Dyssomnias

Intrinsic sleep disorders (excludes general medical and mental disorders)

Extrinsic sleep disorders (includes medication/drug-related causes, poor sleep hygiene, emotional, and stress-related causes)

Circadian rhythm sleep disorders

Parasomnias

Arousal disorders

Sleep-wake transition disorders

Parasomnias usually associated with REM sleep

Sleep disorders associated with medical-psychiatric disorders (Table II)

Associated with mental disorders

Associated with neurological disorders

Associated with other medical disorders

Adapted from Kaplan HI, Sadock BJ. Comprehensive Textbook of Psychiatry. 6th ed. Baltimore, Md: Williams & Wilkins, 1996.

Table II. Medical and psychiatric causes of insomnia

General medical disorders	Psychiatric disorders	Medication and substances of abuse
Cardiopulmonary	Adjustment disorders (stress related)	Alcohol
Coronary or pulmonary insufficiency	Post-traumatic stress disorder	Use or withdrawal
Congestive heart failure	Generalised anxiety disorder	Sedative-hypnotic
Chronic obstructive pulmonary disease	Panic disorder	Tolerance or withdrawal
Asthma	Major depression	Stimulants
Nocturnal cardiac ischaemia	Bipolar mood disorder	Stimulating antidepressants – SSRIs
Sleep apnoea*	Phobias	Theophylline
Pain related	Psychosis	Caffeine
Chronic pain		Nicotine
Fibromyositis		Cocaine
Endocrine and neurological		Other
Sleep-related headaches		Beta-blockers
Dementia		Beta-agonists
Epilepsy		Thyroid hormone
Parkinson's disease		Lamotrigine
Hyperthyroidism		Oral contraceptives
Other		Steroids
Gastro-oesophageal reflux disease		Toxins (mercury, bismuth, lead)
Peptic ulcer disease		

*See 'Intrinsic sleep disorders'.
SSRIs – selective serotonin reuptake inhibitors.

Increased physiological or psychological arousal during the night and negative conditioning for sleep are frequently evident. Decreased functioning during wakefulness is also present. These patients experience a sense of frustration concerning their inability to sleep. The harder they try to sleep the more difficult it becomes.

Behaviour treatment modalities include moving to another bed, using the bed for sleep and sexual activity only, and relaxation training. These behaviour modalities are the first line of treatment, but can be combined with a hypnotic agent if necessary.

Sleep state misperception

Sleep state misperception is a disorder in which the patient complains of insomnia without objective evidence (sleep studies or observation) of sleep disturbance. These patients are overly concerned about the effects of diminished sleep. Reassurance and attempts to identify underlying psychological concerns are frequently unsuccessful. Hypnotic use should be limited as the risk for dependence may be high.

Restless legs syndrome

Restless legs syndrome (RLS) is experienced as a discomfort in the legs which is relieved by moving or stimulating the legs. This feeling is commonly described as a crawling, tingling or prickling sensation. The symptoms tend to increase later in the day or evening. Patients report difficulty in falling asleep as they have to keep on moving their legs to relieve the uneasy sensations. Getting up and walking around, taking a hot shower or rubbing the legs may provide some relief. Pharmacotherapy needs to be explored and individualised because of differing responses. Various drugs such as dopaminergic agents (carbidopa/levodopa),

dopamine agonists, opioids, benzodiazepines (especially clonazepam) and gabapentin have been shown to improve symptoms. This condition and periodic limb movement disorder are more common in older patients. Iron supplements have proved to be effective in patients with serum ferritin levels below 50 µg/dl. Pregnant women or patients on antidepressants complaining of insomnia should also be asked about restless legs. SSRIs have also been associated with RLS.

Idiopathic insomnia is a lifelong inability to obtain adequate sleep. Some defect in the neurological control of the sleep-wake system probably explains the condition.

Periodic limb movement disorder (nocturnal myoclonus)

This disorder is characterised by periodic episodes of repetitive, stereotyped limb movements that occur during sleep. These patients are unaware of the limb movements and complain of either interrupted sleep or excessive daytime sleepiness. Bed partners should be questioned about excessive leg movements during sleep. The diagnosis can also be confirmed by polysomnographic studies.

Idiopathic insomnia

Idiopathic insomnia is a lifelong inability to obtain adequate sleep. Some defect in the neurological control of the sleep-wake system probably explains the condition. This condition is characterised by

lifelong sleep difficulties beginning in childhood.

Narcolepsy

Narcolepsy is a neurological disorder of unknown aetiology characterised by excessive daytime sleepiness associated with cataplexy (episodes of abrupt decrease in muscle tone) and other REM sleep phenomena such as sleep paralysis (temporary inability to talk or move while falling asleep or awakening) and hypnagogic hallucinations (occurring in the transition from wakefulness to sleep or when dozing). Only a minority of patients experience all four of the above symptoms. Cataleptic attacks can consist of either brief, almost imperceptible weakness of isolated muscle groups (loss of grip, jaw drop, head drop) or sudden paralysis of almost all skeletal muscles. These attacks are frequently triggered by intense emotions or sexual arousal.

The onset of narcolepsy usually occurs during the second decade of life, with excessive daytime sleepiness preceding the other symptoms by several years. The diagnosis is confirmed by polysomnographic studies indicating the presence of sleep-onset REM periods (decreased sleep latency) and hypersomnolence during daytime.

There is no cure for narcolepsy but it can be managed with stimulant medications such as dextroamphetamine and methylphenidate. Drug holidays are recommended to minimise development of tolerance. However, abuse potential of these drugs remains a concern. Modafinil is a newly registered novel, wake-promoting agent for the treatment of narcolepsy. It has a mechanism of action similar to that of sympathomimetics that differs from amphetamine and amphetamine-like stimulants.

Recently, low levels of hypocretin, a newly identified neuropeptide, were described in the cerebrospinal fluid of patients with narcolepsy. The role of hypocretins in narcolepsy is intriguing but unclear at this stage.

Obstructive sleep apnoea syndrome

Obstructive sleep apnoea syndrome is characterised by repetitive episodes of upper airway obstruction that occur during sleep. This is usually associated with reduction of blood oxygen saturation. Obstructive apnoea results from a collapse of the upper airways, despite a continuous effort to breathe. The obstruction is released when the patient is briefly aroused or wakes up completely.

Obstructive sleep apnoea is often associated with overweight, middle-aged men, but can occur at any age and also in women. These patients present with excessive daytime sleepiness. Loud snoring, morning headaches and poor sexual functioning are often present. Other important symptoms are prolonged but unrefreshing naps, periods of disorientation and automatic behaviour. Up to 50% of patients who have essential hypertension have obstructive sleep apnoea.

The diagnosis is confirmed by polysomnographic investigations indicating cessation of both nasal and oral airflow for longer than 10 seconds more than 30 times during a seven-hour sleep period.

Symptoms of hypersomnia, poor concentration, irritability and personality changes overlap to some extent with major depression. Prescribing a sedating antidepressant can aggravate sleep apnoea and increases the patient's risk of complications. Sleep apnoea therefore needs to be considered in the differential diagnosis of depression. A timely diagnosis can save a

patient's life as sleep apnoea is associated with cardiovascular disease fatalities.

Continuous positive airway pressure (CPAP) or bi-level positive airway pressure (BiPAP) are used to pneumatically maintain an open airway during sleep. These methods are generally well accepted by patients. In patients who have identifiable anatomical abnormalities, orthognatic surgery appears to be an excellent treatment option. Various drug therapy trials for sleep apnoea are currently being conducted.

Recurrent hypersomnia

This disorder is relatively rare but is most common among male adolescents. Periodic hypersomnia and excessive eating are its major features.

Idiopathic hypersomnia

The patient suffering from this syndrome takes long unrefreshing naps preceded by long periods of drowsiness. It differs from narcolepsy in that daytime sleepiness is more continuous.

Extrinsic sleep disorders

The causes of the disorders arise outside the body and include a wide variety of contributing factors, including drugs, environment and stressors.

Insufficient sleep syndrome

Many patients limit sleep time unintentionally to less than that necessary for normal day-to-day functioning, perhaps owing to a lack of understanding of his/her sleep requirement.

Inadequate sleep hygiene

This category entails bad or irregular sleep habits and sleep-incompatible behaviours. Insomnia results from behaviours that increase arousal. Poor sleep hygiene is also responsible for maintaining some of the other

sleep disorders discussed in this article.

Adjustment sleep disorder

This commonly occurring condition is caused by emotional stressors or change of environment, which results in an anxiety-mediated insomnia. The condition is normally self-limiting and remits once the stressors have been removed or are adjusted to.

Stimulant-, alcohol- and hypnotic-related sleep disorder needs to be ruled out in patients complaining of insomnia.

Sleep disorder related to medication and substances of a use

Stimulant-, alcohol- and hypnotic-related sleep disorder needs to be ruled out in patients complaining of insomnia (Table II). Short-term co-prescription of sedative-hypnotics can alleviate insomnia aggravated by stimulating antidepressants. Tolerance to or withdrawal from sedative-hypnotics is often associated with insomnia. Abrupt withdrawal should be avoided as it can lead to interrupted sleep.

Circadian rhythm sleep disorders

Adults have an intrinsic body clock which regulates a complex series of rhythms, including sleep and wakefulness, fatigue and cognitive ability. This endogenous clock is also influenced by alternation of light and darkness.

Jet lag, shift-work sleep disorder, delayed and advanced sleep phase syndromes and some of the chronic insomnias are caused by a tem-

MAIN TOPIC

poral discrepancy of the body clock in relation to environmental requirements.

Some individuals, especially the elderly, suffer from advanced sleep phase syndrome (excessive sleepiness in the evening and undesired early morning waking). Delayed sleep phase syndrome is more common in adolescents (sleep-onset insomnia and difficulty waking in the morning).

PARASOMNIAS

These can be marked by unusual or bizarre behaviour. Sleepwalking, sleep terrors, nightmares, sleep bruxism and sudden death syndrome in infants are some examples of parasomnias.

MANAGEMENT

Insomnia should be addressed to avoid functional impairment and the possible increased risk of developing anxiety and depressive illnesses. Management includes obtaining a proper history from patients experiencing difficulties with sleep or staying awake (Table III). Identifying behaviour that can interfere with sleep (poor sleep hygiene) needs special attention (Table IV). Underlying psychiatric conditions (Table II) need to be ruled out. Information about duration of the problem can also lead the clinician towards an appropriate diagnosis (Table V). Medical and psychiatric conditions, as well as intrinsic sleep disorders, need to be ruled out in long-term insomnia. Information about excessive leg movements, snoring and breathing problems should be obtained from bed partners. A physical examination and appropriate laboratory investigations to rule out possible underlying medical problems need to be undertaken. Keeping of sleep logs can provide valuable information. These should record time of going

Table III. Assessment of sleeping problem

- Is there difficulty falling asleep or early morning awakening?
- For how long does the person sleep? Is it adequate?
- Does the sleeping problem affect functioning during the day?
- Does the person sleep during the day?
- Does the person take excessive amounts of caffeine or other stimulants?
- Is there an associated medical condition?
- What medication does the person take?
- Is there an underlying psychiatric disorder?
- What psychological or social stresses are there?

From Wilson D. Psychiatry and primary health care. In: Baumann SE, ed. A Practical Guide for Health Care Workers in Southern Africa. Kenwyn: Juta, 1998.

Table IV. Sleep hygiene (behaviour and environmental factors that promote good sleep)

- Keep regular sleeping hours
- Go to bed only when feeling sleepy
- Avoid bright light before bedtime
- Avoid stimulants for six hours before going to bed (caffeine)
- Avoid nicotine, especially near bedtime
- Use the bed for sleeping only
- Avoid exercise near bedtime
- Don't eat a heavy meal before bedtime or go to bed hungry
- Get out of bed when unable to fall asleep within 30 minutes
- Avoid alcohol near bedtime
- Block excessive noise with white noise

Compiled from Lippman S, Mazour I, Shahab H. Insomnia: therapeutic approach. South Med J 2001; **94**: (suppl 1): 15 - 24.

Table V. Classification of insomnia in terms of duration and probable causes in each group

Transient insomnia – lasting a few days

- Jet lag
- Change in sleeping environment
- Acute stress

} Treatment usually not needed

Short-term insomnia

- Stress that doesn't resolve within a few days, such as divorce, bankruptcy – may require short-term symptomatic treatment

Long-term insomnia

- Psychiatric disorder
- Associated drug use/abuse/withdrawal/associated medical disorder
- Intrinsic sleep disorders

to bed, sleep duration and time of waking up during the night and final time of waking up. Daytime naps should also be recorded. Although subjective, the log summarises the patient's perception of the quality and quantity of sleep.

Polysomnographic studies combine

electroencephalographic and electromyographic activity, measurement of eye movements, oxygen saturation, limb movements, air-flow and chest and abdominal movement. These studies are indicated in long-term insomnia with an unidentified cause or in treat-

ment-resistant cases. Multiple sleep latency tests are also indicated in this group if narcolepsy is suspected.

TREATMENT RECOMMENDATIONS

The best results are usually achieved by employing more than one component in the management plan.

Non-pharmacological measures

These are quite effective and should always be regarded as the first line of management. Skills obtained through these measures may have long-term benefits for the patient. Moderate intensity exercise should be promoted and has been reported to improve self-rated sleep quality and sleep duration in elderly patients.

The main psychological therapies that have been studied include sleep hygiene training, relaxation therapies, stimulus control therapy, sleep restriction therapy and paradoxical intention. The principle of sleep hygiene is to promote conditions and behaviour that enhance effective sleep (Table IV).

Relaxation procedures have been employed with varying success rates. Procedures such as progressive muscle relaxation are designed to alleviate somatic and cognitive arousal. Attention-focusing procedures target cognitive arousal through imagery training, meditation, and thought-stopping. Paradoxical intention addresses the conditioned inability to sleep.

Pharmacological measures

Established medications for the symptomatic treatment of insomnia include non-benzodiazepine hypnotics, benzodiazepines and sedating antidepressants or occasional histaminic drugs. The non-benzodiazepines are rapidly becoming the first-line treatment for insomnia. Short-term use of

Table VI. Drugs commonly prescribed for insomnia

Novel non-benzodiazepines Zolpidem Zopiclone	Sedating antidepressants Amitriptyline Mirtazapine Trazodone Nefazodone
Benzodiazepines Oxazepam Temazepam Alprazolam Lorazepam	Antihistamines Hydroxyzine

Compiled from Lippman S, Mazour I, Shahab H. Insomnia: therapeutic approach. *South Med J* 2001; **94**: 866 - 873.

the lowest effective dose should be used to minimise side-effects, rebound insomnia and tolerance. Sleep experts suggest that sedative-hypnotic drugs be used for a maximum of several weeks. Short-term insomnia should be treated for no more than three weeks, while long-term insomnia should be treated intermittently whenever possible. Chronic treatment can be one night in three for up to four months at a time.

Advantages of the non-benzodiazepines include a lower risk of rebound insomnia, dependence, withdrawal symptoms and loss of efficacy over time.

There are numerous antidepressants with sedative-hypnotic properties (Table VI). They are advised for managing insomnia in patients with depression, a history of substance abuse or where the need for extended treatment duration exists. Tricyclic antidepressants are effective for inducing sleep and improving sleep continuity. Low-dose trazodone can be combined with sleep-disrupting psychotropic drugs such as SSRIs.

Antihistamines are effective for managing mild insomnia but next-day sedation and anticholinergic effects may be problematic.

FURTHER READING

- Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. Washington, DC: American Psychiatric Association, 1997.
- Kaplan HI, Sadock BJ. *Comprehensive Textbook of Psychiatry*, 6th ed. Baltimore, Md: Williams & Wilkins, 1996.
- Wilson D. Psychiatry and primary health care. In: Baumann SE, ed. *A Practical Guide for Health Care Workers in Southern Africa*. Kenwyn: Juta, 1998.
- Stahl SM. *Essential Psychopharmacology: Neuroscientific Basis and Practical Application*, 2nd ed. Cambridge: Cambridge University Press, 2000.

IN A NUTSHELL

Sleep disorders can present with insomnia, poor quality of sleep or excessive daytime sleepiness.

One-third of the population suffers from sleep disorders at some time in their life.

An attempt should be made to diagnose and treat or relieve underlying causes of insomnia. Symptomatic treatment is warranted if underlying causes do not respond to treatment sufficiently.

Symptomatic treatment should be time limited and preferably given intermittently.

Non-pharmacological measures should be regarded as part of first-line management. Patients with treatment-resistant and long-term insomnia of unidentified cause should be referred.