

Sleep Disorders in Adolescents

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COLUMN ARTICLE

Introduction

Sleep disorders in children and adolescents is a topic that has been, and remains, neglected in both public health education and professional training. Although much knowledge has been accumulated in recent times, it has been poorly disseminated, hence not effectively seen in clinical practice.

Risk factors:

1. Obesity: Seen in 70% population with SBD. Patients have abnormal ghrelin, leptin and other factors which regulate sleep cycle. Studies indicate role in abnormal architecture thus precipitating conditions like OSA.
2. High arched palate.
3. Deviated septum.
4. Upper airway anomalies.

Normal sleep hours

14 to 18 years-7 to 10 hours.

*Napping in this age group suggests insufficient sleep or a possible sleep disorder.

Classification

The International Classification of Diseases (ICD), 10th edition and the Diagnostic and Statistical Manual of Men-

tal Disorders, DSM-5 (American Psychiatric Association, 2013) classifies sleep disorders as:

- Insomnia disorder: Inadequate quantity or quality of sleep.
- Hypersomnolence disorder: Excessive daytime sleepiness.
- Narcolepsy: Periods of extreme daytime sleepiness, often accompanied by loss of muscle tone.
- Obstructive sleep apnea: Hypopnea Blood oxygen desaturation due to respiratory obstruction during sleep.
- Circadian rhythm: Sleep-wake disorders with Disruption of alignment between the endogenous and exogenous rhythm of sleep/wake.
- Parasomnias: Non-epileptic paroxysmal events during sleep.
- Non-rapid eye movement sleep arousal disorders: Sleepwalking and sleep terrors.
- Nightmare disorders: Nightmares.
- Rapid eye movement sleep behaviour disorder: Repeated episodes of arousal associated with vocalizations and movements such as jumping or kicking (dream-enacting behaviours).
- Restless legs syndrome: Urge to move the legs or other body parts accompanied by uncomfortable sensations [1].

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Most common disorders seen in adolescence are:**OSA (Obstructive sleep apnea)**

Cause excessive sleepiness, changes in personality and adverse effects on social life and performance at work, as well as intellectual deterioration to the extent that dementia is suspected. Only about one-tenth of those with OSA seek medical advice, probably because many of the others do not realise that their daytime problems are the result of their often severely disrupted sleep. Those who have sought medical advice may well have been treated initially, before their sleep disorder was recognised, for the complications of their OSA (such as hypertension or depression) rather than the OSA itself. Most common cause of OSA enlarged tonsils and adenoids the removal of which can improve their sleep and, as a result, at least lessen any learning and behaviour problems.

Simple predictor of severity of OSA is Mallampiti grading [2]:

- Class I: Complete Visualisation of Soft palate.
- Class II: Complete visualisation of Uvula.
- Class III: Complete Visualisation of base of Uvula.
- Class IV: uvula not visualized.

Suspected obstructive sleep apnea (OSA)

If the child has persistent snoring and other risk factors or symptoms of OSA, consideration should be given to a referral to an otolaryngologist (ear, nose, and throat specialist) or sleep physician for further evaluation

Management:**1. Medical management:**

- a. Montelukast: Leukotriene receptor antagonist, emerging therapy. In a recent trial suggested improvement in Obstruction Index post treatment, indicating role in airway remodelling.
- b. Inhaled nasal spray has been shown significant clinical improvement.

2. Surgical management

- a. Adenotonsillectomy is the primary treatment for those with adenotonsillar hypertrophy; based on clinical and sleep studies
- b. Obstructive sleep apnea is usually treated with continuous positive airway pressure (CPAP) based on titration

Restless legs syndrome

This a sensorimotor disorder characterized by an irresistible urge to move the legs.

Conservative treatment includes avoiding exacerbating factors.

Because iron deficiency is common in children, measuring the ferritin level is reasonable. Iron replacement should be initiated if ferritin levels are less than 50 mcg/L and they should be rechecked in three months. There are no medications approved for treating restless legs syndrome in children.

Patients with symptoms that do not respond to conservative treatments should be referred for further evaluation.

Medications

- Benzodiazepines, particularly clonazepam,
- Possible side effects from these medications, include carbidopa/levodopa, pergolide, pramipexole, selegiline, and ropinirole, are nausea, headache and
- Occasional augmentation of symptoms.

Insomnia

Insomnia is a common sleep disorder defined by night time and daytime symptoms.

Night time symptoms include persistent difficulties falling and/or staying asleep and/or non-restorative sleep.

Daytime symptoms of insomnia can include diminished sense of well being, compromised functioning such as difficulties with concentration and memory, fatigue, concerns and worries about sleep.

Diagnosis

- This is made when the symptoms persist for at least 1 month.
- Insomnia is considered chronic if it persists for at least 6 months.

Management

Difficulty initiating and maintaining sleep (insomnia) - Managed with counselling and psychotherapy or psychiatrist intervention.

Narcolepsy

Narcolepsy is characterised by irresistible sleepiness, vivid dreams at sleep onset (hypnagogic hallucinations), and momentary paralysis at sleep onset, fragmented night sleep, and abrupt muscle tone atonia triggered by emotions like laughter, fright, or surprise (cataplexy).

The cataplectic muscle weakness and atonia last only a few minutes, involve chiefly the extensor muscles, and are associated with absence of muscle stretch reflexes but fully preserved consciousness.

Management

Suspected narcolepsy - Children with symptoms suggesting narcolepsy (e.g. severe daytime sleepiness, with or without cataplexy, sleep paralysis, or hypnagogic hallucinations) should be referred to a sleep medicine physician for further evaluation.

Primary snoring disorders

Benign and clinically defined in a child with reliable history of loud habitual snoring and no significant examination findings.

However decreased attention span decreased visuospatial orientation may be seen in these disorders.

Mainstay of treatment remains sleep hygiene measures (as discussed below).

Approach to sleep disorders

- a) History: Three basic screening questions for any patient are

- b) Do you have any difficulty getting off to sleep or staying asleep?
 c) Are you very sleepy during the day?
 d) Do you have any disturbed episodes at night?

Detailed history

Stating details of the patient's typical 24 hour sleep-wake pattern, starting with evening events leading up to bedtime, time and process of getting to sleep, events during the night, time and ease of waking up, daytime sleepiness (including naps), as well as mental state and behaviour during the day

Indications for testing and referral

Thorough assessment and treatment of children with sleep disorders can require a multidisciplinary approach and involves clinicians in general pediatrics as well as subspecialists in child neurology, psychiatry, psychology, otolaryngology, pulmonary medicine, and development.

Ancillary tests**Polysomnography (PSG)**

This typically consists of an all-night recording performed in the sleep laboratory in order to characterize sleep architecture and sleep pathology.

A number of physiological parameters are measured:

- Sleep stages (characterized using a combination of electroencephalography [EEG], eye movements, and muscle tone),
- Respiratory function (including air flow at the nose and mouth, respiratory movements of the chest and abdomen, and oximetry),
- Electrocardiogram (EKG),
- Limb movements,
- A microphone to detect sounds such as snoring or vocalizations, and
- Video recording to characterize movements or behaviors during sleep.

Indications for laboratory-based PSG performed by a sleep technologist include:

- Assessment for a sleep-related breathing disorder (e.g. obstructive sleep apnea [OSA]).
- Assessment for narcolepsy (in conjunction with a multiple sleep latency test [MSLT]).
- Assessment for periodic limb movement disorder (PLMD).
- Patients with neuromuscular disorders and sleep-related symptoms.
- A parasomnia associated with clinical suspicion for a sleep-related breathing disorder or PLMD.
- Patients with suspected sleep-related epilepsy when the initial clinical evaluation and standard EEG are inconclusive, to help distinguish the disorder from a parasomnia.
- Patients with an atypical or potentially injurious parasomnia, to confirm the diagnosis and assess for sleep-related epilepsy.

Interpretation:

- Apnea-hyperpnoea test: Denotes sum of obstructive and partial obstructive events per hour total sleep.
- ICD defines AHI > 1 pathologic and AHI > 5 SDB.
- O.I: Obstructive index: Total number of complete obstructive apneas per hours of total sleep time.

Multiple sleep latency test MSLT)

This is an objective, in-laboratory assessment for excessive daytime sleepiness.

Method: It is performed following nocturnal PSG and consists of five 20-minute nap opportunities at two-hour intervals across the day. The test is based on the concept that the speed with which one falls asleep is an indication of the severity of sleepiness.

The MSLT is also used more specifically to assess for narcolepsy when the clinical history suggests this diagnosis.

Actigraphy

This involves use of a wristwatch-like device to monitor movement at night, usually during a 5- to 14-day period:

Actigraphy has been validated against PSG and shown to provide a reasonable estimate for patterns of sleep versus wakefulness in children and adults.

The advantage of actigraphy over polysomnography is that it captures multiple days of data from the home environment.

Actigraphy is typically used by sleep medicine specialists as part of a comprehensive characterization of sleep/wake patterns and to monitor response to interventions.

Management

Graduated extinction

Parental education

Parents are taught about good sleep practices such as consistent feedings, nap times, bedtime routines, regular sleep-wake times, and placing the child in bed drowsy but awake.

This is fundamentally the same as unmodified extinction, but with scheduled “check-ins”:

- A parent checks on the child on a fixed schedule (e.g. every 10 minutes).
- or in gradually increased intervals (e.g. first check-in after five minutes, second check-in after 10 minutes).
- Parental interactions with the child are calming and positive, but last no more than one minute at a time.

Sleep hygiene measures:

- Use the bed for sleep (no television watching or reading in bed).
- Avoid caffeine, especially late in the day; avoid activities that will get you stimulated and upset late in the day; practice relaxation techniques before bedtime.
- Exercise each day: cycling, running, treadmill are good modes of physical health.

- Maintain a regular schedule for bedtime and waking; avoid naps.
- Do not watch the clock while in bed; avoid struggling to fall asleep in bed—instead, get up and spend quiet time out of bed until sleep comes.
- Positive bedtime routines/faded bedtime with response cost.
- Response cost: The child is removed from bed for a specific amount of time if sleep onset does not occur within the desired period.
- Positive bedtime routines like Relaxing/calming activities are implemented before bedtime (e.g. bedtime stories).
- Faded bedtime: Bedtime is delayed until the predicted time of sleep onset to decrease the time the child spends in bed awake.
- Scheduled awakenings: Parents must document the pattern of night time awakenings. The child is awakened before the normally predicted night time awakening, and the number of scheduled awakenings is slowly decreased over time.

Long-term monitoring

- Regular follow-up is essential to monitor appropriate use of equipment for obstructive sleep apnea, adherence to medications, and for worsening of symptoms or related complications.
- Cognitive behavioral therapy “refresher” sessions every 3 months to yearly will also help maintain good sleep hygiene strategies.

Pharmacological management:

Sedatives and hypnotics: Short-term drug therapy is preferred to restore a normal sleep pattern. Generally, hypnotic drugs are approved for 2 weeks or less of continuous use.

In chronic insomnia

Drugs—Zolpidem and zaleplon are the newest and, arguably, the safest agents.

Rapid onset of action is characteristic of flurazepam and triazolam.

Non benzodiazepine: Ramelteon is a melatonin receptor agonist with high selectivity for human melatonin MT1 and MT2 receptors.

Diet and activity

- No special diet is needed to treat insomnia, but large meals and spicy foods should be avoided in the 3 hours before bedtime.
- Patients should avoid sleep-disturbing substances such as nicotine, and caffeine.
- Nicotine and caffeine are stimulating and should be avoided in the second half of the day, from late afternoon on.
- Consumption of tryptophan-containing foods may help induce sleep; the classic example is warm milk.
- Strenuous exercise during the day may promote better sleep, but this same exercise during the 3 hours before bedtime can cause initial insomnia [3-9].

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