

Excessive Daytime Sleepiness (EDS)

See also Insomnia, Sleep apnea, Narcolepsy

Background

1. Definition
 - Drowsiness, which interferes w/ daytime activities, results in unavoidable napping, or both
2. General info
 - Sleepiness excessive when it occurs at inappropriate times
 - Eg, at work, while driving, in conversation, sitting on toilet
 - Sleep deprivation most common cause
 - PEARL
 - Most types of chronic insomnia assoc w/ daytime hyperarousal rather than EDS
 - EDS in pt w/ insomnia suggests comorbidity such as sleep-related breathing disorder or mood disorder¹

Pathophysiology

1. Pathology
 - Not completely known
 - Sleep/wake cycle (circadian rhythm) controlled by CNS
 - Neuromodulation of sleep and wakefulness involves
 - Dopamine
 - Epinephrine
 - Norepinephrine
 - Acetylcholine
 - Serotonin
 - Histamine
 - Glutamate
 - Adenosine
 - Gamma-aminobutyric acid
2. Incidence/ prevalence
 - Prevalence 8.7-20% (M=F)²
 - Seems to decr linearly w/ incr age between 30 and 75 yrs
 - Higher prevalence in young thought to be result of unmet sleep needs
 - Higher prevalence in very old secondary to incr health problems and med ailments
3. Risk factors
 - Overweight (BMI > 28)
 - Multifactorial contributory risk factors include:
 - Substance abuse (eg, caffeine, alcohol, smoking, drugs)
 - Ethanol most commonly used substance w/ sedative effects
 - Medications
 - Use - stimulants, antihistamines, beta blockers, bronchodilators³
 - Withdrawal - hypnotics, sedatives, glucocorticoids

- Quality/quantity of sleep inadequate for lifestyle
 - Most common cause of EDS
- Psychiatric disorders - depression, anxiety, PTSD
- Underlying sleep disorder - narcolepsy, sleep apnea (obstructive and nonobstructive), RLS
 - Less common: primary hypersomnia of central origin
- Med conditions
 - COPD
 - Heart failure
 - Chronic pain
 - Renal failure
 - Hypothyroidism
 - Tumors
 - Anemia
 - Gastroesophageal reflux disease
 - Trauma
- Shift work - may cause circadian pacemaker misalignment
- Jet lag
- 4. Morbidity/ mortality
 - Morbidity
 - Decr productivity
 - Incr or worsening depressive Sx
 - Incr propensity for injury and accidents
 - Decr academic performance
 - Tardiness
 - Poor health
 - Compromised professional performance (incl physicians and judges)^{4,5}

Diagnostics

1. History: Assoc Sx helpful in Dx
 - Medications - prescription and nonprescription meds (incl drugs of abuse)
 - OSA
 - Snoring, gasping, witnessed apneas
 - Caused by blockage of upper airway
 - Defined as > 5 apneic or hypopneic episodes per hr of sleep
 - Prevalence 9% in women and 24% in men³
 - Narcolepsy
 - Cataplexy
 - Sleep paralysis
 - Hypnagogic (w/sleep onset) or hypnopompic (at end of sleep) hallucinations
 - Most common primary hypersomnia
 - Sleep disturbance assoc w/mood disorder
 - Depressive Sx
 - Anxiety
 - PTSD

- Insufficient sleep syndrome
 - Short nocturnal sleep time w/longer sleep on days off and less prominent EDS on vacations
 - Delayed sleep phase syndrome
 - Difficulty falling asleep at night, difficulty waking morning and more prominent hypersomnolence on days when pt must awaken by a set time
 - Advanced sleep phase syndrome
 - Evening sleepiness and early morning awakening
 - Shift work sleep disorder
 - Pts occupation and work schedule
 - Periodic limb movement disorder (PLMD)
 - Witnessed limb movements
 - Chronic pain
 - Incr or uncontrolled pain Sx
 - Nocturia
 - Waking in middle of sleep cycle to urinate
 - Assoc w/metabolic syndromes
 - Obesity
 - Diabetes
 - Insulin resistance
2. Physical exam
- In pts w/suspected sleep-disordered breathing
 - Body habitus
 - Fat distribution around neck
 - Head and neck exam
 - Extremity swelling in pts w/suspected heart failure
 - Stiffness or deformities of extremities w/ suspected neuropathic pain or rheumatologic dz
 - Psychomotor slowing, blunted affect, poor hygiene may suggest depression
 - Abnormal mental status (esp in older population) as early Sx of dementia
3. Diagnostic testing
- An approach to Dx and mgmt of this topic is seen in diagram Diagnosis and Management of Conditions That Cause Excessive Daytime Sleepiness⁴
 - <http://www.aafp.org/afp/2009/0301/afp20090301p391-f2.gif>
 - Lab tests
 - TFTs = TSH (for possible hypo- or hyperthyroidism)
 - Fasting glucose, random glucose and/or HbA1c (for possible hyperglycemia assoc w/diabetes or metabolic syndromes)
 - CBC and iron studies for possible RLS
 - BUN and Cr (evaluation of uremia assoc w/ renal insuff)
 - HLA typing for narcolepsy - not generally used for screening
 - Epworth Sleepiness Scale (ESS) or Stanford Sleepiness Scale
 - Pt-completed assessments used as screening tests
 - Score of ≥ 12 on ESS of falling asleep while driving, consider further eval

- ESS questionnaire
<http://www.sleepeducation.com/SleepScale.aspx>
- Sleep log or actigraphy
 - For suspected circadian rhythm disturbances (adv or delayed sleep phase syndromes)
 - Wrist actigraph: activity/movement detector capable of 24-hr recordings for several days or wks
 - Based on fact that during sleep there is little movement compared w/wakefulness
- PSG to diagnose OSA, PLMD
- MSLT - A nap study used to determine how quickly someone falls asleep during day in a quiet situation (measuring tendency to fall asleep)
 - Considered standard way to measure sleepiness w/proven sensitivity and reproducibility for quantifying sleepiness, regardless or type of sleep deprivation³
 - If indicated, done day after overnight PSG
 - Confirms EDS, quantifies severity of EDS and determines presence of early onset REM periods (SOREMPs)

Differential Diagnosis

1. Sleep-disordered breathing
 - OSA
 - UARS
 - Central sleep apnea
2. Periodic limb movement disorder
3. Narcolepsy; idiopathic hypersomnia
4. Inadequate sleep hygiene; insufficient sleep syndrome
5. Mood disorders
6. Circadian rhythm disorders
 - Delayed and advanced sleep phase syndrome
7. Shift work sleep disorder
8. Metabolic syndromes
 - Obesity
 - Insulin resistance
 - Diabetes
 - Hypo- or hyperthyroidism

Therapeutics

1. Acute treatment
 - Irrelevant, since multifactorial causes, detailed hx and physical needed w/ possible Dx testing
2. Long-term care
 - If primary problem, educate on lifestyle modifications such as
 - Good sleep hygiene (dedicate at least 8 hrs to sleep per day w/ maintenance of sleep journal)
 - Avoidance of stimulants (caffeine, alcohol, nicotine)

- Avoidance of shift work
 - Limitation of naps to no longer than 45 min
- Consider modafinil as first-line agent for Tx in pt w/ shift work disorder (SOR:B)^{3,6}
- If secondary Sx, treat underlying cause
 - Diabetes control
 - Depression
 - Obesity
 - Neuropathic pain / rheumatologic dz
 - Metabolic syndromes
 - OSA
 - CPAP therapy leads to decline in daytime sleepiness and lower risk of MVAs (SOR:B)
- Legal requirements for reporting EDS that may impair driving
 - Vary from state to state
 - Treating physician has responsibility to make clinical assessment of pts overall risk of unsafe driving w/ documentation of recs and precautions³

Follow-Up

1. Close f/u by phone and/or in person to determine compliance w/ Tx
 - Allows for psych support and evaluation of med intervention effectiveness

Prognosis

1. Once cause identified and controlled, Sx tend to improve
2. Depending on many factors, resolution of Sx variable

Prevention

1. Identification and control of concomitant med problems incl wt control
2. Avoidance of stimulants prior to sleeping
3. Engaging in good sleep hygiene
4. Engaging in regular exercise routine

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