



SLEEP-RELATED BREATHING DISORDERS



Sleep Related Breathing Disorders



- Primary Central Apnea
- Central Apnea Due to Cheyne Stokes Breathing
- Central Apnea Due to High Altitude Periodic Breathing
- Central Apnea Due to Medical Condition Not Cheyne Stokes
- Central Apnea Due to Drug or Substance
- Obstructive Sleep Apnea
- Sleep Related Hypoventilation/Hypoxemic Syndromes
- Sleep Related Hypoventilation/Hypoxemia Due to Medical Condition
 - Due to pulmonary parenchymal or vascular pathology
 - Due to lower airways obstruction
 - Due to neuromuscular & chest wall disorders
- Other Sleep Related Breathing Disorders
 - Sleep apnea/Sleep related breathing disorder, unspecified



Primary Central Sleep Apnea



- A. Patient reports at least one of the following:
 - i. Excessive daytime sleepiness
 - ii. Frequent arousals and awakenings during sleep or insomnia complaints
 - iii. Awakening short of breath
- B. Polysomnography shows 5 or more central apneas per hour of sleep



Primary Central Sleep Apnea



- Key Points
 - Caused by instability of the respiratory control system in the transition from wakefulness to sleep
 - Tend to occur in patients with high ventilatory responsiveness to CO_2
 - lower PaCO_2 levels exist (close to apnea threshold)
 - Treatment (recommended):
 - Adaptive Servoventilation (ASV):
 - Unlike conventional sleep disorder breathing therapies such as CPAP for CSA, adaptive servoventilation treats complex sleep apnea syndrome and central sleep apnea, normalizes breathing, completely suppressing CSA and/or Cheyne-Stokes respiration (CSR) and improves sleep architecture (the amount of time the patient spends in slow-wave and REM sleep increases).



Cheyne Stokes Breathing Pattern



- A. Polysomnography shows at least 10 central apneas and hypopneas per hour in which the hyperpnea has a crescendo-decrescendo pattern of tidal volume accompanied by frequent arousals from sleep and derangement of sleep structure
- B. The breathing disorder occurs in association with a serious medical illness, such as heart failure, stroke, or renal failure



Cheyne Stokes Breathing Pattern



Key Points

- Usually in NREM, better in REM
- Typically occurs at transition from wakefulness to non-REM sleep and during stages 1 and 2; tends to dissipate and slow wave sleep and REM
- Arousals occurred termination apneas
- Seen in males, >60 yrs.
- Atrial fib and hypocapnea frequently seen
- Awake PaCO₂ of 38 mm/Hg or less
- Moderate oxygen desaturations : drops in SpO₂ to 80-85%
- Treatment (recommended):
 - Adaptive Servoventilation (ASV):
 - Unlike conventional sleep disorder breathing therapies such as CPAP for CSA, adaptive servoventilation treats complex sleep apnea syndrome and central sleep apnea, normalizes breathing, completely suppressing CSA and/or Cheyne-Stokes respiration (CSR) and improves sleep architecture (the amount of time the patient spends in slow-wave and REM sleep increases).



Central Sleep Apnea Due to Drug or Substance



- A. The patient has been taking long acting opioid regularly for at least 2 months
- B. Polysomnography shows a central apnea index of > 5 or periodic breathing (at least 10 central apneas and hypopneas per hour in which the hyperpnea has a crescendo-decrescendo pattern of tidal volume accompanied by frequent arousals from sleep and derangement of sleep structure)

Key Points

Most commonly associated with methadone but other narcotic agents have been implicated



Adult Obstructive Sleep Apnea



- A. At least one of the following applies:
 - A. The patient complains of EDS, fatigue, or insomnia
 - B. Patient wakes up Breath-holding, gasping, or choking
 - C. Bed partner reports loud snoring were breathing interruptions
- B. Polysomnography shows the following:
 - A. ≥ 5 scorable respiratory events per hour
 - B. Evidence of respiratory effort during all or portion of each respiratory event

OR

- C. Polysomnography shows the following:
 - A. ≥ 15 scorable respiratory events per hour
 - B. Evidence of respiratory effort during all or portion of each respiratory event



Adult Obstructive Sleep Apnea



KEY POINTS

- Increased incidence of morning headaches, hypertension, EDS
- Events 10-30 sec. long but can be a minute or more
- Events worse in REM due to skeletal muscle atonia
- Associated with desats from 1% to >40%
- Longer in duration and more severe desats in REM
- Snoring and excessive daytime sleepiness
 - Worse with alcohol consumption & increase in weight
 - At risk for systemic hypertension and type II diabetes



Adult Obstructive Sleep Apnea



Treatment Options

- Continuous positive airway pressure (CPAP) is gold standard
- Oral appliances
 - Mandibular advancement devices
 - Tongue stabilizing devices
- Oral/nasal surgery
 - UPPP
 - Mandibular Advancement Surgery
- Body repositioning therapy
- Weight loss