Obstructive Sleep Apnoea (OSA)

Definition

Intermittent and repeated upper airway collapse during sleep → irregular breathing at night (assoc with sleep arousal or SaO_2 by ≥3%), and excessive sleepiness during the day. Research continues on link between sleep fragmentation and upper airways obstruction

- Complete apnoea = 10s pause in breathing activity.
- Hypopnoea aka partial apnoea = 10s of ventilation reduced by at least 50%.

Aetiology

- Lack of muscle tone while asleep
- Excess upper airways tissue
- Anatomical abnormalities in upper airway & jaw

Risk Factors

- Male gender
- Middle age (55 to 59 in men, 60-64 in women)
- Smoking
- Obesity
- Neck circumference (<37cm low risk, >48cm high risk).
- Sedative Drugs
- Excess alcohol consumption
- Possibly genetic tendency related to jaw morphology
- Metabolic Syndrome
- Diabetes

Presentation

History: Daytime somnolence (Epworth Sleepiness Scale>10), snoring, irregular breathing or choking episodes during sleep, witnessed apnoeas.
Examination: No specific. Obesity, fat deposition anterolateral to the upper airway, neck circum, anatomical anomalies e.g. retrognathia, micrognathia, enlarged tonsils.

Differential Diagnosis

- Central sleep apnoea – loss of autonomic drive to breathe
- Fragmented sleep (quality of sleep)
- Sleep deprivation (quantity of sleep)
- Shift work
- Depression
- Narcolepsy
- Hypothyroidism
- Restless leg syndrome/periodic limb movement disorder
- Drugs
    - Sedatives
    - Stimulants (caffeine, theophyllines, amphetamines)
    - Beta-blockers
    - Selective serotonin reuptake inhibitors (SSRIs)
    - Idiopathic hypersomnolence
    - Excess alcohol.
- Neurological conditions - Dystrophica myotonica, Prev encephalitis or HI, Parkinsonism

Diagnosis

Clinical assessment is not sufficient to make a diagnosis of OSA.
Bloods: TFT & ABG occasionally required.
Polysomnography (PSG): Sleep study where various physiological recordings are taken including EEG, two electro-oculograms (EOG) to measure horiz and vert eye movements, and an EMG.
Apnoea/Hypopnoea Index (AHI) = no. apnoea/hypopnoea episodes whilst asleep:

- Mild: AHI = 5-15 per hour
- Moderate: AHI = 16-30 per hour
- Severe: AHI >30 per hour.

Pulse oximetry
Finger plethysmography to detect changes in peripheral vasoconstriction,
Heart rate – Analysis of very low frequency components of HR activity

Management

Continuous positive airway pressure (CPAP): Proven efficacy.
Intra-Oral Devices: Produce anterior displacement of the mandible → ↑upper airway diameter.
Behavioural interventions: General lifestyle changes - ↓Weight loss, ↓smoking, ↓alcohol
Pharmacological treatments: Limited role. **Modafinil** may afford some benefit.
Surgery: Equivocal evidence. Procedures include:

- Uvulopalatopharyngoplasty (UPPP) - patients may be unable to use CPAP subsequently
- Laser-assisted uvulopalatopharyngoplasty (LUAP)
- Mandibular or maxillary advancement
- Tonsillectomy - appropriate for tonsillar enlargement
- Tracheostomy - may be necessary in severe OSA where other treatments fail.

Complications

- Excessive daytime sleepiness may → accidents in the home, at work, and whilst driving.
- Irritability, depression and other psychological consequences may ensue.
- Cardiovascular complications include HT, IHD, CCF and CVA.

Prognosis

Good short term prognosis if CPAP successful in terms of reduction in daytime sleepiness, snoring, and an improvement in cognitive function and general health status after 4-8 weeks treatment.