

THE RELATIONSHIP BETWEEN COPD AND OSA

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Discussion topics

- Overview of COPD and OSA
- The effects of sleeping on breathing
- Sleep in COPD
- Overlap syndrome
- Patient screening
- Patient treatment

COPD

- Refers to a group of lung diseases that block airflow during exhalation and result in dyspnoea and airflow that is not entirely reversible
- Progressive disease that results in a chronic inflammatory response
- Coincides with chronic bronchitis and emphysema
- Projected to be the 3rd leading cause of death by 2020

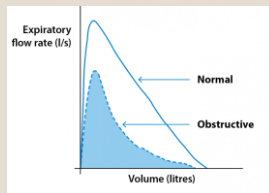


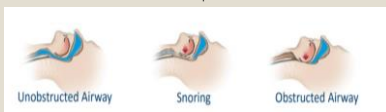
Table 1. COPD diagnosis and levels of severity
(Source: 2018 Global Initiative for Chronic Obstructive Lung Disease)

| Classification of severity: | FEV ₁ % (or FEV ₁ /FVC) | Post-bronchodilator FEV ₁ |
|-----------------------------|--|--|
| Mild | <.70 | ≥80% predicted |
| Moderate | <.70 | 50% ≤ FEV ₁ <80% predicted |
| Severe | <.70 | 30% ≤ FEV ₁ <50% predicted |
| Very severe | <.70 | FEV ₁ <30% predicted or FEV ₁ <50% predicted plus chronic respiratory failure* |

* Chronic respiratory failure defined as Pao₂ <60 mm Hg with or without a PACO₂ >50 mm Hg while breathing room air.

OSA

- OSA is one of the most common sleep disorders



- Characterised by partial or complete collapse of the upper airway during sleep
- Around 9% of women and 25% of men in Australia have clinically significant OSA and of that 4% of men and women have symptomatic OSA.

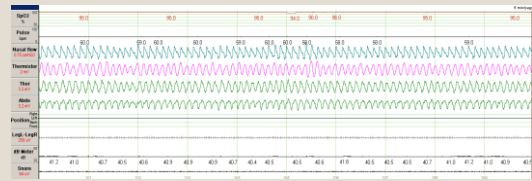
Risk factors

- Obesity (especially obesity around the abdomen and neck) – but remember, OSA can also occur in people who are not overweight or obese
- Large neck circumference (>43cm for men and >40cm for women)
- Age over 50 years (although OSA affects individuals of all ages, including children and adolescents)
- Certain facial abnormalities, including a high, narrow, elongated, soft palate, a small chin, an abnormal bite and a small jaw
- Family history of OSA or sleep-disordered breathing
- Cigarette smoking and excessive alcohol consumption
- Medications, especially sedatives at night.

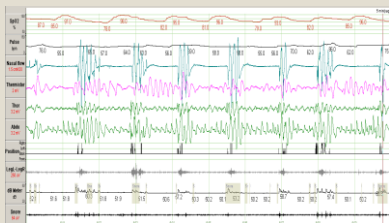
Signs & Symptoms

- Snoring
- Episodes of gasping, snorting or choking during sleep
- Excessive daytime sleepiness, fatigue or lethargy
- Lack of energy and endurance
- Falling asleep or needing to have a nap during the day
- Disturbed or restless sleep (OSA sometimes causes insomnia)
- Poor memory and concentration
- Morning headaches
- Dry mouth or sore throat upon waking
- Irritability, depression, anxiety, mood and behaviour changes
- Increased frequency of urination during the night (nocturia)

Normal sleep



Sleep apnoea



Sleep in COPD patients

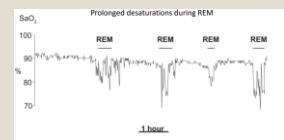
- How does COPD impact sleep?
 - Symptoms cause sleep disturbance (coughing & wheezing)
 - Hypoxemia and hypercapnia disturb sleep
- How does sleep impact COPD?
 - Reduced chemosensitivity
 - Reduced pulmonary function
 - Impaired muscle performance
 - Systemic inflammation

What is overlap syndrome?

- Refers to diseases that overlap one another - combined effect of multiple diseases or conditions are worse than either one alone
- First introduced in 1985 by Professor David Fenley (University of Edinburgh)
- Additive effect '1+1=3' (one disorder may exacerbate the other)
- As many as 15% of COPD patients have co-existent OSA
- For patients with GOLD stage 4 COPD, the prevalence of OSA is 43%

Overlap syndrome

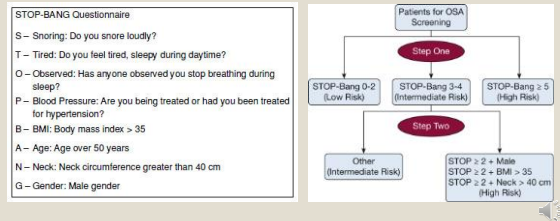
- Patients with the Overlap Syndrome have increased risk of complications compared to those with COPD or OSA alone
- Respiratory failure
- Pulmonary hypertension
- Hypoventilation
- More severe hypoxemia



Patient screening/diagnosis

- Awareness that Overlap Syndrome might be a possibility...
- STOP-BANG Questionnaire

Patient screening: STOP-BANG



Patient screening/diagnosis

- Respiratory function tests
- Patient history + physical exam
- ABGs and Overnight oximetry
- Confirmed by PSG – preferably in lab

Patient treatment

- Weight loss
- Bronchodilator therapy –manage exacerbations with antibiotics/steroids
- CPAP therapy
- Oxygen therapy
- Bi-level ventilatory support

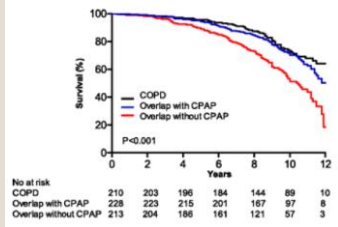
Patient treatment: CPAP

- CPAP is first line treatment.
- May not fully correct hypoxemia, so supplemental oxygen may be required.
- Patients on CPAP less likely to suffer severe COPD exacerbations requiring hospitalisation.
- High humidification to mobilise secretions
- By using CPAP there could potentially be an unloading of the respiratory muscles which could lead to:
 - Decreased hypoventilation, O₂ consumption, or CO₂ production by the respiratory muscles.
 - Resting of respiratory muscles.

Patient treatment: Oxygen

- Frequently prescribed in COPD in pts with daytime and/or nocturnal hypoxaemia
- Data is lacking for improvement with oxygen therapy alone in OSA
 - nocturnal oxygen desaturations are improved, BUT...not if used alone
 - sleep architecture
 - arousals
 - blood pressure (which is improved after 2 weeks of CPAP therapy)
 - subjective daytime sleepiness
- **Alford Study**
 - 4L/min oxygen administered to 20 men with Overlap Syndrome
 - Obstructive events increased in duration (25.7 to 31.4)
 - PCO₂ increased (52.8 to 62.3)
 - Oxygen should not be used alone for treatment

CPAP reduces death rates



Marín, Soriano, Carrizo, Boldova, & Bartolomé, 2010.

Conclusion

- Awareness that Overlap Syndrome might be a possibility
- Screen for COPD in OSA and vice versa
- Ongoing education for both patients and health professionals

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Any Questions?