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Obstructive Sleep Apnea and its Relationship to Cardiovascular Disease

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As the medical community continues to enrich its understanding of obstructive sleep apnea (OSA), it also expands its knowledge in OSA’s tight connection to cardiovascular disease. OSA is a respiratory disorder recognized by repetitive closure of the upper airway during sleep and, consequently, causes a recurrent cycle of sleep disturbances and intermittent hypoxia (Salvo, 2014). OSA has demonstrated its capability of increasing risk for cardiovascular diseases including hypertension, ischemia heart disease, cerebral vascular accidents, arrhythmias, and congestive heart failure (Molinari, Caron, Vincenti, & Aquilani, 2005). Signs and symptoms of this disease can be overlooked and the long term cardiovascular effects can be detrimental. It is important for advanced practitioners to recognize the severity of OSA and understand its relationship with cardiovascular disease. The purpose of this presentation is to educate current and future practitioners on the key components of OSA and its links to cardiac disorders. The pathophysiology of the disease, related signs and symptoms, and the implications for nursing care will be discussed.

**Signs & Symptoms**

OSA occurs during sleep, when the upper airway becomes blocked repeatedly and reduces or completely stops airflow. As a result, the following signs and symptoms are often detected:

- **Tiredness or daytime sleepiness**
- **Frequent loud snoring**
- **Gasping or choking during sleep**
- **Increased deep sleepiness or fatigue**
- **Decreased attention, motor skills, vigilance**
- **Dry mouth or headaches especially when waking**

Due to the frequent absence of breathing, the patients experience intermittent hypoxia that causes the heart to work harder and blood vessel lining to break down or become inflamed. Chronic OSA patients may experience hallmark cardiovascular signs and symptoms such as:

- **Bustering Pectoral**
- **Heart Palpitations**
- **Shortness of breath**
- **Nasal congestion**
- **Right heart failure**

(National Heart, Lung and Blood Institute, 2017)

**Underlying Pathophysiology**

Intermittent hypoxia and increased PaCO2 activate central and peripheral chemoreceptors that stimulate the sympathetic nervous system (SNS). Pulmonary stretch receptors, which normally decrease the SNS, are hindered due to apnea. Stroke volume and blood pressure are reduced due to intrathoracic effects of OSA and trigger carotid sinus baroreceptors to activate the SNS. Finally, frequent arousals from OSA stimulate the SNS and also decrease the normal vagal (PNS) activity which accounts for post-apneic boosts of heart rate and blood pressure.

**Implications for Nursing Care**

- Nurses can positively impact the outcomes of patients with OSA by first educating the importance of modifying their risk factors of OSA: losing weight, limiting alcohol before bed, not sleeping back side down.
- Nurses are at the forefront in healthcare and have a significant amount of patient contact. Nurses need to be vigilant when monitoring for S&G of OSA and especially with differentiating snoring from OSA. If sleep apnea is suspected, nurses need to advocate for a diagnostic sleep study.
- Early treatment for OSA involves losing weight, changing sleeping positions, and monitoring sleep patterns.
- If OSA persists, a CPAP machine may be necessary to keep a patient’s airway open while sleeping.
- Nurses need to be aware that CPAP is an effective tool, however, it is uncomfortable and patient adherence is suboptimal. Nurses need to truly investigate CMP compliance for nightly use.
- If there is failure to comply or failure to improve symptoms, nurses may advocate for surgical treatment such as an implantation of a geniculate nerve stimulator.
- Nurses should keep in mind that OSA is a disease that needs to be monitored and treated.

References


**Conclusion**

- In conclusion, OSA is a common respiratory disorder that leads to significant cardiovascular disease.
- Being aware of the importance of early recognition and treatment can help to reduce the complications associated with OSA.
- By understanding the pathophysiology surrounding sleep apnea, healthcare providers can work to ensure they are practicing in a way that is evidenced based and precise.
- Nurses should keep in mind that regular education on OSA can positively impact outcomes associated with OSA. It is the responsibility of the healthcare provider to ensure that they are following evidence based diagnostic’s and treatment strategies and recognize the potential cardiac risks of OSA.