

Abstract P6

A Novel Theory: Chronic Inflammation Affects Both Upper & Lower Airway in Obstructive Sleep Apnea (OSA) & Laryngotracheal Stenosis (LTS)

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Objective: Both Obstructive Sleep Apnea (OSA) and Laryngotracheal Stenosis (LTS) cause narrowing of the airway. The Venturi effect states as air passes through a narrow tube, it will move faster, reducing the pressure in that area. According to Bernoulli principle, the tube will collapse to reduce this negative pressure, enabling the area to become more rigid and open up. Studies have shown that due to snoring in OSA patients, traumatic vibrations at the upper airway caused inflammation and denervation of their mucosa and muscle. We conducted a cross sectional study to determine if the trachealis muscle in OSA and LTS patients undergo similar trauma due to airway constriction.

Methods: A total of 43 patients were included. Seven had OSA (3 mild, 3 moderate and 1 severe). Ten had LTS, all with history of prolonged intubation and diagnosed as Cotton-Myer grade III stenosis. There were 26 controls comprising of patients with no OSA or LTS undergoing elective tracheostomy. Biopsies were obtained from the uvula (upper airway) and trachealis muscle (lower airway) using a biopsy forcep 2mm in diameter to avoid excessive injury.

Result: Histopathological examination (HPE) of the uvula revealed significant hyperplasia of seromucinous glands in the cases compared to the controls, suggestive of chronic inflammation. This may cause excessive salivation intra-orally and affect surgical procedures. Stromal oedema that occurs in chronic inflammation was 3 times more likely to occur in these cases. HPE of trachealis muscle showed significant increase in lymphoplasmic cells (LPC) among cases, signifies presence of chronic inflammation in the lower airway of OSA and LTS patients. The control group however are 3 times more likely to have polymorphonuclear (PMN) cell infiltration compared to the cases showing acute inflammatory response rather than chronic inflammation.

Conclusion: Both upper and lower airways are affected in OSA and LTS patients.

Keywords: obstructive sleep apnoea, laryngotracheal stenosis, trachealis muscle, inflammation

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