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Review Article

Management of obstructive sleep apnea using oral appliances: A Review (Part I)

Kavitha PR[1], P Vivek[2], Bhat S[3]

[1]Assistant Professor, Department of Orthodontic and Dentofacial Orthopedics, [3]Professor, Vyas Dental College and Hospital, Jodhpur, Rajasthan, [2]Assistant Professor, Department of Pedodontics and Preventive Children Dentistry, A.B. Shetty Memorial Institute of Dental Sciences

Abstract

Sleep-Disordered breathing (SDB) describes a group of disorders characterized by abnormalities of respiratory pattern (pauses in breathing) or the quantity of ventilation during sleep. Obstructive sleep apnea (OSA) is one of the commonest types of SDB, it is a condition characterized by the repetitive total or partial collapse of the pharyngeal airway during sleep leading to oxygen desaturation or arousals.

The first part of our review tries to give an explanation of etiology, signs and symptoms, pathophysiology, diagnosis and management of OSA. The second part focuses on the role of a dentist in treating OSA using various oral appliances (OAs) and the dental changes brought about, side effects of appliances and patient compliance.

Key words: Sleep-disordered breathing (SDB), Obstructive sleep apnea (OSA)

Introduction

Obstructive sleep apnea (OSA) is a common upper air way disorder characterized by repetitive, complete or partial closure of the upper airway during sleep, resulting in sleep fragmentation and oxygen desaturation, the condition is also associated with loud snoring[1,2]. When there is a cessation of airflow at the mouth and nose for 10 seconds or more, then such a condition is termed apnea (Greek word 'apnea' means-without breath)[3]. During this time, the individual's oxygen levels will drop. If a person experiences 30 or more apneic episodes during a seven-hour sleep period, that person is believed to be suffering from sleep apnea syndrome. These episodes can last from 10 to 120 seconds. These apnea events terminate with a partial awakening or an arousal. It is important to understand that these arousals are necessary for the person to begin breathing again[4], as these arousals increase the activity of tongue and throat muscles that enlarge the airway[5]. OSA is a relatively common condition occurring in 2 to 4% of males and 1 to 2 % of females in middle age[6]. Though it can occur in any age, the prevalence increases with the age. The problem is even more common among obese people, with 40% of men and 3% of women having the disorder[6].

Pathophysiology

The underlying pathophysiology of OSA is complex and not fully understood. The causes are multifactorial and may vary considerably between individuals. Important risk factors include obesity, male sex, and aging. However, it is generally accepted that stability and patency of the upper airway plays an important role[3,7].

An obstruction in the upper airway can occur in three areas. They are the nasopharyngeal, oropharyngeal, and hypopharyngeal regions. The nasopharynx is the part of the pharynx that lies above the level of the soft palate. The oropharynx is the division of the pharynx that lies between the soft palate and the upper edge of the epiglottis. The hypopharynx is the division of the pharynx that lies below the upper edge of the epiglottis and opens into the larynx and esophagus[4,8,9].

The upper airway obstruction during sleep may occur as a result of narrowing of the respiratory passages. Partial obstruction results in loud, irregular snoring sounds caused by air rushing through the narrow passage and stimulating the soft palate, uvula, throat walls and tongue to vibrate. The narrower the airway passage,

Correspondence

Dr. Vivek P., Assistant Professor, Department of Paediatric and Preventive Children Dentistry, A.B. Shetty Memorial Institute of Dental Sciences, Mangalore, India, E-mail: vivek_pdr@rediffmail.com