Scholars Journal of Applied Medical Sciences (SJAMS)
Abbreviated Key Title: Sch. J. App. Med. Sci.
ISSN 2320-6691 (Online)
ISSN 2347-954X (Print)

A Unit of Scholars Academic and Scientific Society, India
www.saspublishers.com

Radiology

Obstructive Sleep Apnea- An Overview

Rabindran[1*], Shasidaran[2]
[1]Consultant, Neonatologist, Billroth Hospital, Chennai, India,
[2]Senior Resident, Department of Radiology, S.R.M. Medical College and Research Centre, Chennai, India

Review Article

***Corresponding author**
Rabindran

Article History
Received: 03.12.2018
Accepted: 13.12.2018
Published: 30.12.2018

DOI:
10.36347/sjams.2018.v06i12.023

Abstract: OSA occurs due to upper airway obstruction with shallow breathing lasting for 20- 40 seconds during sleep along with decreased blood oxygen saturation. There are various risk factors for OSA like obesity, narrow airway, hypertension, chronic sinusitis, smoking, diabetes, hypothyroidism, stroke, asthma and Craniofacial syndromes. Signs and symptoms of OSA include excessive daytime sleepiness, snoring, abrupt awakenings during sleep, sensation of sore throat, morning headache, mood changes, high blood pressure, GER and nocturia . Polysomnography is helpful for diagnosing OSA. The number of apneic events per hour is reported as the apnea-hypopnea index (AHI). Management of OSA includes lifestyle changes, losing weight, regular exercise, quitting smoking & alcohol, using a nasal decongestant & avoiding sleeping on the back. Newer methods are available to overcome OSA like CPAP, BiPAP, Nasal EPAP and Auto CPAP. Untreated OSA leads to coronary artery disease, heart failure, stroke, aortic aneurysm, arrhythmia and glaucoma. However early diagnosis and prompt management can increase the quality of life of patients suffering from OSA.
Keywords: Obstructive Sleep Apnea, Polysomnogram, CPAP.

INTRODUCTION

Obstructive sleep apnea (OSA) is caused by complete / partial upper airway obstruction, characterised by repetitive episodes of shallow breathing lasting for 20- 40 seconds during sleep, associated with decreased blood oxygen saturation [1].

Risk factors for OSA include obesity (Fat deposition around upper airway), narrow airway (enlarged tonsils/ adenoids), hypertension, chronic nasal congestion, chronic sinusitis, large neck circumference, smoking, diabetes, family history of sleep apnea, hypothyroidism, neurologic syndromes, stroke, acromegaly and asthma. Some medications like sedatives, narcotic analgesics and general anaesthetics relax the upper airway and worsens OSA. OSA is prevalent in some Craniofacial syndromes like Down syndrome, Treacher Collins syndrome, Marfan syndrome, Prader-Willi syndrome and Pierre Robin sequence and as a post-operative complication of pharyngeal flap surgery[2].

Signs and symptoms of obstructive sleep apnea include excessive daytime sleepiness, snoring, abrupt awakenings during sleep with feeling of gasping/ choking, sensation of dry mouth/ sore throat, morning headache, worsening concentration, mood changes, high blood pressure, night time sweating, attention/ behaviour problems, gastroesophageal reflux and nocturia [3]. Hypoxia related to OSA affects neurons of hippocampus and right frontal cortex leading to hippocaampal atrophy [4].

In assessing obstructive sleep apnea, detailed physical examination is mandatory. Throat, mouth and nose should be examined for any abnormalities. Neck and waist circumference should be measured. Blood pressure should be documented. Additional evaluation includes overnight monitoring of breathing and body functions during sleep. Specific tests include Polysomnography where heart, lung and brain activity, breathing pattern, arm and leg movements and blood oxygen levels are monitored during sleep. To grade the severity of sleep apnea, the number of events per hour is reported as the apnea-hypopnea index (AHI). An AHI of less than 5 is normal, 5-15 is mild OSA, 15-30 is moderate OSA and more than 30 events per hour suggests severe severe sleep apnea [5]. Home sleep apnea testing is a home version of polysomnography. Sidestream darkfield imaging (SDF) is useful for microcirculation monitoring before and after PSG.

Management of obstructive sleep apnea is multifactorial. Lifestyle changes for decreasing

symptoms include losing weight, regular exercise, quitting smoking & alcohol, using a nasal decongestant or allergy medications & avoiding sleeping on the back. Sleeping at a 30-degree elevation of upper body prevents gravitational collapse of the airway [6]. Treatment involves using a device to keep the airway open or a mouthpiece to thrust the jaw forward during sleep. Methods to overcome OSA include Positive airway pressure where a machine delivers air pressure through a nasal or oro-nasal mask. The most common type is continuous positive airway pressure (CPAP) where constant pressure of air is used to keep the upper airways open [7]. Bilevel positive airway pressure (BiPAP) is another type of positive airway pressure which delivers a preset amount of pressure during inspiration and a different pressure during expiration. In Nasal EPAP, a bandage-like device is placed over the nostrils which utilize a person's own breathing to create positive airway pressure [8]. Automatic positive airway pressure (Auto CPAP) incorporates pressure sensors and monitors the person's breathing. Mouthpiece (oral device) is useful for mild to moderate obstructive sleep apnea which prevents obstruction by keeping throat open, pushing jaw forward or adjusting tongue position.

Upper airway stimulation is a device useful for people with obstructive sleep apnea who can't tolerate CPAP or BiPAP. Here a thin impulse generator is implanted under the skin in upper chest which detects breathing patterns and stimulates nerve controlling tongue movement during obstructive episodes. Neurostimulation with an implanted hypoglossal nerve stimulation system and exercises of muscles around mouth and throat through activities like playing wind instrument, didgeridoo or double reed instruments are newer methods [9]. Modafinil can be used for residual sleepiness in OSA patients who are effectively using CPAP.

Surgical options include Uvulopalatopharyngoplasty (UPPP), laser-assisted uvulopalatoplasty) or radiofrequency ablation which may reduce snoring. Jaw surgery like maxillomandibular advancement increases space behind tongue and soft palate decreasing obstruction. Tracheostomy is done in severe, life-threatening OSA. Nasal polypectomy, turbinectomy, septal surgery for deviated nasal septum, surgical removal of enlarged tonsils or adenoids are done in certain situations. Genioglossus advancement, Hyoid suspension, Maxillomandibular advancement and bariatric surgery for morbid obesity are also being done. Minimally invasive treatment for mild OSA involves placement of tiny polyester rod implants in soft palate which stiffens soft palate and reduces airway collapse.

Complications of untreated OSA include Cardiovascular problems like coronary artery disease, heart attack, heart failure, stroke, aortic aneurysm and arrhythmia & Eye problems like glaucoma [10]. Early diagnosis of this condition and prompt management can increase the quality of life of patients suffering from obstructive sleep apnea.

REFERENCES

1. Michael J. Thorpy. Classification of Sleep Disorders. Neurotherapeutics. 2012 Oct; 9(4): 687–701.
2. Sloan GM. Posterior pharyngeal flap and sphincter pharyngoplasty: the state of the art. Cleft Palate Craniofac J. 2000 Mar;37(2):112-22.
3. Punjabi NM. The Epidemiology of Adult Obstructive Sleep Apnea. Proc Am Thorac Soc. 2008 Feb 15; 5(2): 136–143.
4. Gale SD, Hopkins RO.Effects of hypoxia on the brain: neuroimaging and neuropsychological findings following carbon monoxide poisoning and obstructive sleep apnea. J Int Neuropsychol Soc. 2004 Jan;10(1):60-71.
5. American Academy of Sleep Medicine Task Force. Sleep-related breathing disorders in adults: recommendations for syndrome definition and measurement techniques in clinical research. Sleep. 1999;22:667-89.
6. Loord H, Hultcrantz E. Positioner–a method for preventing sleep apnea. Acta oto-laryngologica. 2007 Jan 1;127(8):861-8.
7. Bratton DJ, Gaisl T, Wons AM, Kohler M. CPAP vs mandibular advancement devices and blood pressure in patients with obstructive sleep apnea: a systematic review and meta-analysis. Jama. 2015 Dec 1;314(21):2280-93.
8. Riaz M, Certal V, Nigam G, Abdullatif J, Zaghi S, Kushida CA, Camacho M. Nasal expiratory positive airway pressure devices (Provent) for OSA: a systematic review and meta-analysis. Sleep disorders. 2015;2015.
9. Guimarães KC, Drager LF, Genta PR, Marcondes BF, Lorenzi-Filho G. Effects of oropharyngeal exercises on patients with moderate obstructive sleep apnea syndrome. American journal of respiratory and critical care medicine. 2009 May 15;179(10):962-6.
10. Gaisl T, Bratton DJ, Kohler M. The impact of obstructive sleep apnoea on the aorta. European Respiratory Journal. 2015 Aug 1;46(2):532-44.