

Obstructive Sleep Apnea: An Emerging Risk Factor for Stroke

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Rec date: Nov 16, 2016; Acc date: Nov 26, 2016; Pub date: Nov 28, 2016

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Commentary

Obstructive sleep apnea, a sleep-related breathing disorder that causes partial or complete obstruction of breathing affects 6% to 17% of general population. However, it affects adults over the age 60 at much higher rates. Some studies report prevalence rates as high as 49% in elderly [1]. This disproportionate increase is due to competing mechanistic factors such as age-related changes in pharyngeal and upper airway muscle size and function, increased sleep fragmentation, instability in ventilator control, and differential effects of hormones on upper airway function. Perhaps the most concerning factor is that majority of these patients are undetected [2,3]. The detrimental effect of obstructive sleep apnea (OSA) on cardiovascular function is well known. Now, there is growing body of evidence showing impairment in neurologic, psychometric and endocrine function due to OSA as well.

In particular, OSA is being recognized as a modifiable risk factor for stroke prevention. Several prospective studies show higher incidence of obstructive sleep apnea after stroke regardless of type of stroke or timing after stroke [4-8]. A meta-analysis looking at the relationship between obstructive sleep apnea and stroke looked at nine studies with total of 18,271 patients and found OSA significantly increased the risk of developing stroke (RR=2.02, 1.40-2.90) [9]. In addition, men with moderate to severe obstructive sleep apnea have two to three-fold increased risk of stroke after adjusting for confounders such as hypertension. In women, this increased risk is seen in those who suffer from severe OSA [4]. Male age, body mass index and atrial fibrillation are independent predictors of OSA in patients with stroke/transient ischemic attack.

Obstructive sleep apnea is not only a risk factor for stroke, but may also exacerbate the damage produced by the stroke. Patients with stroke and untreated OSA require longer stay at the hospital and rehabilitation facilities, have lower functional capability and higher risk for subsequent strokes [10,11].

Given the increased incidence of obstructive sleep apnea in elderly and the detrimental effect of untreated obstructive sleep apnea, it becomes important to include screening for obstructive sleep apnea an important component of a geriatric assessment. The gold standard test for diagnosing OSA is nocturnal laboratory polysomnography (PSG). Portable sleep monitors (PSMs) have been also found to be feasible in diagnosing OSA in patients with stroke. Limited accessibility to PSG/PSMs especially in resource-poor and/or high-disease burden settings remains a challenge. In such settings, many tools have been studied and validated in ambulatory settings such as Berlin's questionnaire, STOP-BANG and sleep obstructive apnea score optimized for stroke (SOS). These tools can be completed by patients or their caregivers in waiting rooms. They may aid in ruling out OSA. However, given the

atypical presentation of post-stroke/TIA OSA, PSM/PSG should still be performed to establish diagnosis.

In patients with stroke, treatment of obstructive sleep apnea with continuous positive airway pressure (CPAP) can improve function and motor outcomes and reduce future risk of vascular events [12-16]. However, compliance with CPAP is lower in patients post stroke due to physical and cognitive impairment resulting from the stroke. In addition, barriers such as cost and lack of caregiver support may influence a person's ability to use CPAP. Therefore, alternative therapeutic options such as an oral appliance or novel nasal expiratory positive pressure devices can be used as means for harm reduction, if clinically appropriate.

Early detection and appropriate treatment of obstructive sleep apnea may reduce further burden on an aging brain and improve quality of life. It's crucial to raise awareness among health care professionals of the role of OSA in stroke risk, outcome and recurrence. A tailored personal therapeutic strategy is needed to address the complex needs of patients with OSA in setting of recent stroke/TIA.

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