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Editorial

Asthma and obstructive sleep apnea: More than an association!

Sleep-related breathing disorders are a spectrum of condition among them obstructive sleep apnea (OSA) is the most severe and complex chronic clinical syndrome. This is characterized by repeated episode of upper airway occlusion, resulting in brief period of breathing cessation (apnea) or a significant reduction in airflow (hypopnea) during sleep. Person with OSA may experience loud snoring, oxygen desaturation, frequent arousal, and disruption of sleep. Disturb sleep also results in hypersomnolence, impaired concentration during daytime, and poor quality of life. OSA largely remains under-recognized and underdiagnosed entity. The global prevalence of OSA varies from 0.3% to 5.1% in general population.[1] In India, OSA varied from 4.4% to 13.7% (4.4%–19.7% in males and 2.5%–7.4% in females) in different studies.[2] Prevalence of OSA increases with age particularly in adults >60 years. The increasing rate of obesity also contributes to rise in OSA. Other contributing factors include male sex, anatomical factors, genetic and metabolic disorders, smoking, and postmenopausal female etc.[3]

Recent studies have shown that there is a link between bronchial asthma and OSA and there is a bidirectional relationship where each disorder adversely influences the other one.[4] Patients of asthma appear to have an increased risk for OSA than general population. The first study that examines asthma and OSA was a case report by Hudgel and Shucard in 1979.[5] Since then, several studies have shown an increased prevalence of sleep disturbances among asthmatic patients.[6,7] Epidemiological studies demonstrate that asthma patients more frequently report snoring, excessive daytime sleepiness, and apnea. A recent population-based prospective epidemiological study showed that asthma is associated with an increased risk of new-onset OSA.[8] In this landmark study, the incidence of OSA over 4 years in patients with self-reported asthma was 27%, compared with 16% without asthma. The relative risk adjusted for risk factors such as body mass index, age, and gender was 1.39 (95% confidence interval: 15%–19%).

Despite this well-described association between asthma and OSA, the mechanisms that link the duo still remain hypothetical. Some of the putative pathways that link OSA with asthma include increased parasympathetic tone during apnea, hypoxemia-related reflex bronchoconstriction, irritation of upper airway neural receptors, altered nocturnal neurohormonal secretion, increased inflammatory mediators (both local and systemic), gastroesophageal reflux, and obesity.[9] Corticosteroids may be a potential contributory factor through effect on upper airway caliber (increased adiposity) or dilator muscle function (steroid myopathy) as identified in a study on dose-dependent relationship with inhaled corticosteroids and risk of OSA.[10] Further, it is to be noted that OSA and asthma are often complicated by shared comorbidities and potential for multidirectional casual pathways, i.e., obstruction, inflammation, obesity, gastroesophageal reflux disorder, and rhinitis. The coexistence and hypothetical link between cough/asthma, obesity/OSA, rhinosinusitis, and esophageal reflux has also been coined as "CORE syndrome" to be specially considered among asthma patients refractory to the therapy.[11]

On the other hand, OSA may adversely affect asthma-related outcomes. There is accumulating evidence to suggest that OSA is associated with the poor asthma control, more nocturnal symptoms, and frequent exacerbations in asthma patients.[4] OSA has been found to be associated with specific changes in airway inflammation that is predominantly neutrophilic with high levels of matrix metalloproteinase-9, interleukin-8, and low reticular basement membrane thickness in patients with severe asthma, suggesting changes in airway remodeling.[12] Interestingly, patients who are diagnosed with OSA and treated with continuous positive airway pressure (CPAP) seem to have better asthma control in terms of improved asthma symptoms as well as better morning peak expiratory flow rates and quality of life. It seems that CPAP has beneficial effects on mechanical and neuromechanical properties of lower airways apart from ameliorating gastroesophageal reflux and local as well as systemic inflammation. CPAP also restores sleep and further helps to control asthma.[13]

It is, therefore, important to identify this dual, rather complex, association between asthma and OSA. There are more than enough evidences that OSA is not uncommon among asthma patients; however, it is poorly investigated. OSA is largely overlooked in patients having uncontrolled asthma. Patients with poor asthma control despite optimal recommended management need to be screened for possible OSA so as to reduce treatment cost, morbidity, and improved quality of life in such patients. Future research on this "alternate overlap syndrome" will further improve our understanding on this topic with some more useful insights for better management strategies.

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