Reply to the editor

Sir,

The original article on obstructive sleep apnea (OSA) being associated with higher health care utilization in the elderly highlights not only the risk of hospitalization in OSA, but also the widespread implications of the well-known pandemic — obesity.[1] In this letter, we would like to elucidate other respiratory complications associated with obesity, which often goes unanticipated.

Central obesity impairs ventilatory function. Increased body mass index (BMI) is typically associated with a reduced forced expiratory volume in one second (FEV1), forced vital capacity (FVC), total lung capacity, functional residual capacity (FRC), and expiratory reserve volume (ERV), with spirometry showing a restrictive pattern more often than obstructive, with low FVC and normal FEV1/FVC. Progressive fat accumulation over the anterior chest wall and abdominal wall is associated with decreased thoracic wall compliance and diaphragmatic excursion and diminished respiratory muscle endurance, leading to increased work of breathing and airway resistance. There is decreased basal inspiratory expansion of the lungs with consequent ventilation-perfusion mismatch and arterial hypoxemia. Hence, obesity leads to increased respiratory complications, especially on exertion and in supine positions of sleep and anesthesia.[2,3]

Increased BMI has been associated with increased frequency of wheezing and breathlessness in asthma although obesity has not been found to be associated with increased airway hyper-responsiveness. The increase in symptoms in obese patients is most probably due to altered ventilation dynamics and decreased lung compliance. It has also been speculated that the systemic inflammation with elevated IL-6, IL-8, and TNF-α associated with obesity may lead to glucocorticoid unresponsiveness in some patients. Thus, obesity increases hospitalizations due to increased frequency of acute asthmatic exacerbations.[2]

Similarly, obesity and chronic obstructive pulmonary disease (COPD) seem to synergize with each other, with decrease FEV1 associated with both conditions leading to worsening airflow obstruction, and hypoxia. In overlap syndrome (COPD with OSA), there is a greater risk for respiratory failure and cor pulmonale as compared to COPD alone, pertaining to increased sympathetic overactivity leading to greater cardiovascular morbidity and mortality.[2,3]

Obesity hypoventilation syndrome, associated with hypercapneic respiratory failure and cor pulmonale, may be present in one-fifth of patients with OSA, or may occur as an isolated entity due to obesity alone. Sleep-related disturbance and pulmonary hypertension leads to significant morbidity in these patients.[2]

Obesity also causes increased respiratory complications in anesthetized and intubated patients. Thicker necks, poorer neck mobility, and smaller upper airway caliber, make intubation and ventilation difficult. Increased volume of distribution in adipose tissue, makes the required dosages for sedatives and anesthetics unpredictable. There is also a tendency to desaturate faster due to an already low lung reserve and hence need to be intubated faster. The risks for ventilation associated atelectasis also increases due to decreased FRC and ERV. Extubation also poses difficulties in these patients, who frequently require a high flow of oxygen in the sitting or lateral recumbent position along with continuous or bilevel positive airway pressure to prevent airway collapse, basal atelectasis, and hypoxemia.[2,3]

Therefore, it goes without saying that managing obesity would lower health care utilization not only because of OSA but also a vast number of significant other respiratory diseases.

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