A Systematic Approach to Central Sleep Apnea in an Era of Medical Complexity

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In this issue, Regn and colleagues (page 78) have provided a concise resource for primary care professionals (PCPs) on a lesser known sleep disorder that is increasingly common in veterans.[1] Their review provides a basic understanding of central sleep apnea (CSA) and a systematic clinical approach to diagnosis and treatment in primary care. We applaud the authors for providing education on sleep disorders to the *Federal Practitioner* audience, since sleep disorders are prevalent among military service members and veterans, with significant implications for health, wellness, productivity, and cost. The American workforce has a long-held sense of pride in working hard, often at the expense of sleep. Early work start times are common in the military and federal government, and sleep medicine specialists have the expertise necessary to diagnose and treat the myriad of sleep disorders that have come to light recently. A massive shortage of sleep medicine specialists limits the evidence-based sleep treatment implementations in medical care.

Medicine has become increasingly complex, necessitating a highly connected web of people, resources, institutions, and processes to keep up with the demands of growing information and technology. The evolution of a systems approach to health care built momentum during the 21st century.[1-3] The National Academy of Medicine has published 2 reports that raised concerns about the quality and safety of medical care.[4,5] With this expansion, the potential for medical errors at individual components or relationship nodes between actors in the medical system also has grown. Medical errors encompass more than acts of commission and can also take the form of acts of omission by failing to diagnosis and appropriately treat before long-term or irrevocable health consequences occur. A systems approach seeks to aid clinical decision making to improve the quality of medical care and patient outcomes in an otherwise complex medical system that can be difficult to navigate.

Although awareness of obstructive sleep apnea (OSA) has increased, CSA has not received the same level of attention and may not be recognized by PCPs. A lack of education about CSA can contribute to acts of omission in a health care setting. Although CSA is ultimately diagnosed and managed in specialty care sleep medicine clinics, PCPs play an instrumental role in referring patients for evaluation and then collaborating with specialists to optimize care and outcomes. The multidisciplinary approach of CSA management is important because it overlaps with many conditions that are commonly seen in primary care, including obesity, chronic pain, congestive heart failure (CHF), chronic kidney disease, and hypothyroidism. These chronic conditions are also prevalent among veterans. In a national cross-sectional study, veterans had higher prevalence rates of chronic health conditions, including cardiovascular disease and kidney disease, compared with nonveterans (odds ratios, 1.4 and 1.2, respectively).[6]

It is important to understand the relationship between CSA and chronic medical conditions because recognizing the signs of CSA can lead to identification of underlying medical conditions. Likewise, the chronic medical conditions that lead to CSA may cue the PCP's clinical suspicion for CSA and lead to specialty care referrals if needed. The clinician also serves a significant role in the management of CSA by optimizing medical care for the underlying condition prior to pursuing additional specialty care treatments like positive airway pressure (PAP). For example, PCPs are often involved in the management of atrial fibrillation and cardiac dysfunction, which can minimize or exacerbate CSA. PCPs should also be aware of which drugs are associated with the presentation of CSA as withdrawal or reduction of the medication can resolve symptoms without further evaluation by a specialist.

The review by Regn and colleagues updates readers on developments—and lack thereof—in the literature. Treatment options for CSA have been limited. For most patients, continuous PAP (CPAP), which is the gold standard treatment for OSA, is not an effective CSA treatment. Earlier specialty guidelines endorsed adaptive servo-ventilation (ASV), a more sophisticated respiratory assist device, for treating CSA. In 2015, the SERVE-HF trial examined the effects of ASV in combination with guideline-based medical treatment on survival and cardiovascular outcomes for patients who had CSA and HF with reduced ejection fraction.[7] They found that ASV had no significant effect on the primary endpoints of first event of death from any cause, lifesaving cardiovascular intervention, or unplanned hospitalization for worsening HF. However, all-cause and cardiovascular mortality were both increased with ASV. There has not been a more recent large clinical trial that either refutes or reinforces those findings (ADVENT-HF found that ASV effectively treated CSA and OSA in patients with CHF but had no impact on the primary endpoint of mortality).[7,8] We are unlikely to see more studies soon that will put this issue to rest and change the guidance that is currently available for ASV use.

Regn and colleagues also provide an update on the use of acetazolamide as to assist in CSA treatment. This should be done cautiously and potentially deferred to subspecialists in sleep medicine, cardiology, or nephrology. The theoretical benefit of acetazolamide in CSA is based on its promotion of excretion of sodium bicarbonate, leading to metabolic acidosis, which can stimulate central respiratory drive. Since CSA is characterized by episodic loss of central respiratory drive, it seems logical that a respiratory stimulant would provide benefit. However, acetazolamide is not approved by the US Food and Drug Administration for CSA.[9] In those with impaired respiratory mechanics, CHF, chronic obstructive pulmonary disease, and obesity hypoventilation syndrome, this medication has the potential for harm by adding metabolic acidosis to a patient with concurrent respiratory acidosis or respiratory constraints that limit their ability to compensate effectively for additional acid-base derangements.

It is worth noting that Regn and colleagues do not make claims outside the intended scope. It accomplishes the mission of providing all PCPs with an updated streamlined summary for diagnosing and treating CSA. Such tools are important in an age of growing medical information technology because it can improve the quality of medical care and ultimately, patient outcomes with timely diagnosis and treatment. This is particularly significant in a veteran population with a high burden of chronic medical conditions and polypharmacy.

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