Obstructive Sleep Apnea in a Pilot

By J. Ron Allen, MD, MPH

Insufficient sleep is an ever-worsening public health problem within the United States. This growing problem is linked with motor vehicle accidents, aircraft mishaps, industrial disasters, medical and other occupational errors.[1] Obstructive sleep apnea (OSA) is a major contributor to the insufficient sleep epidemic. It is estimated that OSA affects 4-7% of middle-aged adults, 70% of the clinically obese population, 30-50% of those with heart disease, and 60% of those suffering strokes.[2] This article presents a case of a third-class pilot with OSA and the related aeromedical concerns.

History

A 65-year-old male third-class pilot with 650 hours of flight time presented to his AME for his medical recertification with a new diagnosis of obstructive sleep apnea. He had been relatively healthy previously with only a documented history of hypertension. Over the past couple of years, his blood pressure had become increasingly difficult to control and required escalating doses of atenolol to achieve control, with his current requirement being 100mg daily. He had been snoring for years; his weight was steadily on the rise, with his BMI increasing from 41 to 43.5 kg/m.[2] He was sent for a polysomnograph secondary to his symptoms and risk factors that included: obesity, daytime fatigue, hypertension, and snoring. He denied routinely taking naps and stated that he had never fallen asleep while he wanted to remain awake, including while driving and flying. The polysomnograph was positive with an AHI of 21.3. He was titrated with CPAP to a pressure of 10 cm during the split-night protocol. He attempted to use the CPAP machine at home but did not tolerate it for various reasons. He switched to a mouth guard specifically designed for OSA and reported improvement. He remained mildly sleepy during the day with minimal snoring at night, confirmed by his wife. He was sent for a maintenance of wakefulness test, which he was able to remain awake throughout; however, due to continued daytime somnolence, he was denied re-certification. He will be able to re-apply once he has been adequately treated and therapeutic benefit can be validated.

Aeromedical Issues

Daytime drowsiness and the implications for flight safety is an obvious aeromedical concern. However, the implications and severity of the situation may not be fully appreciated by airman. It has been reported that people with mild to moderate OSA can have degradation in their performance that is equivalent to a blood alcohol level of 0.06-0.08%, legal intoxication in most states.[2] Not only is the degradation in performance concerning, but micro naps and the inability to maintain wakefulness while flying may be hazardous. Issues with concentration, attention span, memory, headaches, and irritability are all associated with OSA. These present unique risks in the aviation environment.

The direct effects of OSA and one's ability to fly are very concerning. Secondary complications and comorbid conditions

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Obstructive Sleep Apnea

The growing obesity problem for the United States is leading to a subsequent obstructive sleep apnea epidemic. This rise in OSA has become a concern not only for the impact on the individual but on the safety of the population as well. The National Highway Traffic Safety Administration reports people with OSA have a six times greater risk for automobile accidents. Drowsy drivers account for 100,000 accidents, with 1,550 fatalities and 40,000 injuries annually.[5] The National Sleep Foundation estimates that sleep deprivation and sleep disorders cost the United States more than $100 billion annually when lost productivity, property damage, and medical expenditures are taken into account.[6] This growing problem for the aviation community was highlighted in February 2008 when a commercial aircraft with three crewmembers and 40 passengers continued past their scheduled destination. The National Transportation Safety Board concluded that the captain's undiagnosed OSA and the flight crew's recent work schedule contributed to both the pilot and the first officer falling asleep and subsequent missed arrival.[2] Thankfully, no one was injured, but this case highlights the importance of OSA in today's aviation environment. The increasing OSA population, combined with other fatigue risk factors of alcohol, time zone changes, and irregular work schedules, presents a significant risk to aviation safety.

OSA is a treatable condition with many well established treatment options, including weight loss.[7] The issue then becomes recognizing the risk factors, especially the modifiable ones, and increasing the population's self-recognition of the warning signs, as well as AMEs awareness of the disease and responses on history that are suggestive of OSA. Daytime somnolence, uncontrolled hypertension, snoring, a narrow oropharyngeal airway, and a BMI >30 should all alert the clinician to a possible issue of OSA.[8] Prevention, recognition, and treatment will lead to safer skies through mitigation of an unnecessary risk.

present challenges and hazards as well. Heart disease, hypertension, stroke, myocardial infarction, heart failure, cardiac arrhythmia, diabetes, and metabolic syndrome have all been associated with OSA.[3] These conditions may directly or indirectly have severe implications for the airmen and their ability to fly safely

OSA is disqualifying from flying for all classes of medical certification in accordance with Title 14 of the Code of Federal Regulations, part 67. It requires for initial special issuance, at a minimum, a current status report, all pertinent medical information, medication report, and polysomnograph with titration study results.[4] The aviation medical examiner should be vigilant for the risk factors, as well as the signs and symptoms of sleep apnea. An airman presenting with daytime sleepiness, BMI >30, or excessive snoring should alert the AME of a potential problem. Once a diagnosis has been established, the minimum requirements (above) must be submitted and, depending on the treatment plan (uvulopalotophyngoplasty, continuous positive airway pressure, or oral device), additional testing may be required to demonstrate therapeutic improvement and mitigation of the more significant aeromedical safety concerns.

Therapeutic improvement for OSA often requires uvulopalatopharyngoplasty or continuous positive airway pressure (CPAP). Dental devices may be an alternate form of therapy as well. Regardless of the treatment course chosen, evaluation of the effectiveness of eliminating the primary aeromedical concern daytime hypersomnolence, also known as excessive daytime sleepiness, will need to be established. This can often be accomplished with a follow-up sleep study in those who have had surgery or a CPAP titration report from the initial split-night polysomnogram. For initial issuance, these reports, along with the airman's acknowledged improvement in symptoms, will usually suffice. If an airman is seeking a re-issuance, then a compliance report from the CPAP machine may be required per AME Assisted Special Issuance requirements.

The effectiveness of a dental device may be more difficult to analyze. A maintenance of wakefulness test (MWT) may be of benefit. In this study, the applicants are monitored similar to a polysomnograph; however, they are requested to remain awake during four 40-minute daytime test periods spaced at two-hour intervals throughout the day. These data are then compared against normative values with the endpoints being completion of the 40-minute period or sleep onset. The results determine a propensity to fall asleep during the day. These studies, along with the clinical picture and co-morbid conditions, are used to evaluate the safety of flight issue for any given airman.

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About the Author

Lt Col. J. Ron Allen, MD, MPH, is a USAF flight Surgeon board certified in Family Medicine and currently participating in the USAF residency in Aerospace Medicine program. He wrote this report while rotating at the FAA's Civil Aerospace Medical Institute.