



Obstructive Sleep Apnea Awareness

Case Vignette: OSA and Chronic Cough

Presenting Complaints

A 61-year-old female of the Te-Moak Tribe of western Shoshone Indians of Nevada visited the local Southern Bands Health Center with a 5-year history of chronic cough. She explained that she has had a dry cough that was worse at night and during the winter months.

Past History

She gave a history of significant sinus congestion, post-nasal drip with seasonal worsening and occasional GERD over the past 5 years. She reported frequent episodes of bronchitis following upper respiratory infections that resulted in use of multiple courses of antibiotics and steroids to relieve shortness of breath and nasal and chest congestion. In addition, she had a diagnosis of childhood asthma but had no exercise induced wheezing, nocturnal awakenings, or specific allergen-related exacerbations. A constant feature of her bronchitic episodes was nocturnal cough that would keep her from sleeping.

Her therapies, as prescribed by her previous primary care provider consistently included an oral antihistamine tablet, a leukotriene-receptor antagonist, and a proton-pump inhibitor. With exacerbations, inhaled steroids, bronchodilators, and antibiotics were added. Each time the cough would improve temporarily.

She has had multiple normal chest x-rays and pulmonary function tests. Investigative workup included a Rocky Mountain RAST (radioallergosorbent test) panel, which showed elevated IgE antibodies to Mountain cedar; skin scratch allergy tests showed wheal and erythema reactions to Kentucky bluegrass, Bermuda grass, Mountain cedar, cat hair, and Western Juniper.

When questioned further, she also added that she has been feeling increasingly fatigued and has also had sleep disruptions from her cough. Additionally, she complained of mild daytime somnolence.

Her past medical history was otherwise unremarkable. She had never smoked and did not consume alcohol. She attained menopause around 7 years ago.



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Physical Exam

- BMI- 27.1
- BP- 128/82 mmHg
- Methacholine challenge test- negative
- Clinical examination and chest radiograph were normal.
- Spirometry was consistent with a moderate restrictive defect consistent with obesity.

Testing

The physician asked her to complete the Epworth Sleepiness Questionnaire to assess her daytime somnolence.

The ESS subjectively assesses excessive daytime sleepiness by asking patients to rate their chance of dozing off from 0 (would never doze) to 3 (high chance of dozing) for 8 commonly encountered scenarios, with a total maximal score of 24.

Would never doze	Slight chance of dozing	Moderate chance of dozing	High chance of dozing	
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sitting and reading
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Watching TV
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sitting inactive in a public place (e.g. cinema or in a meeting)
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Being in a car for an hour as a passenger (without a break)
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Lying down to rest in the afternoon (when possible)
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sitting and chatting to someone
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sitting quietly after lunch (not having had alcohol)
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	In a car when you stop in traffic for a few minutes
Calculate Score				
Your Score				
6				

Figure 1. Results of Epworth Sleepiness Score



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Test results:

The ESS score generated was 6/24 (Figure 1). A score in the range of 6-10 is interpreted as normal. [[About the ESS](#)]

Her current provider was aware that OSA is significantly prevalent in chronic cough patients. Besides, her risk factors for OSA were being postmenopausal and overweight. So he ordered an overnight PSG sleep study. Her results showed an apnea-hypopnea index (AHI) of 47 per hour. This indicated severe obstructive sleep apnea. He completed a referral to see a sleep specialist.

Discussion of Treatment Plan

The patient agreed to try CPAP therapy at a subsequent follow-up sleep specialist clinic. She was admitted for a CPAP titration study and a pressure of 8 cm H₂O was implemented. She noticed a significant improvement in cough, lethargy, and somnolence at the end of the first week on CPAP therapy.

Outcome of Case

The patient followed up for a year after initiation of CPAP therapy and noted dramatic improvement in her cough. In addition to improvements in sleep quality and reductions in awakenings from nocturnal cough, she has not experienced the frequent episodes of bronchitis as she did prior to CPAP therapy. Besides using nocturnal CPAP and maintenance proton-pump inhibitors, she uses an antihistamine and a leukotriene receptor antagonist to control her nasal secretions.

Teaching Points

The most common etiologies for chronic cough in non-smokers are upper airway cough syndrome (UACS), gastro-esophageal reflux (GERD) and asthma, all of which are empirically treated. However, the etiologies of 12% to 42% of coughs are unexplained despite thorough evaluation. Chronic cough is prevalent in patients with sleep disordered breathing (SDB) and is associated with female sex, symptoms of nocturnal heartburn and rhinitis. The mechanism of OSA due to testosterone has been reported to be secondary to increased collapsibility of the airway. Although the exact mechanism of OSA remains controversial, testosterone-induced sleep apnea is an obvious occurrence.



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This case highlights the coexistence of OSA in a patient with chronic cough. The initial investigations for this patient were directed at determining the etiology of chronic cough using a standardized diagnostic algorithm. The lack of clinical suspicion of obstructive sleep apnea at presentation with cough led to a considerable delay in diagnosis which was over 5 years in this patient.

Obstructive sleep apnea was not apparent at presentation in this patient. Although she did not exhibit daytime somnolence according to the ESS score, she was eventually diagnosed with severe OSA. The severe OSA may have been masked by the severity of the coughs, or perhaps the ESS score is not sufficiently sensitive for diagnosing OSA. Another point to note is that while OSA is typically thought of as a condition affecting men, the prevalence of OSA increases with age and body mass index. The sex disparity of OSA ends around age 55 with a sharp rise among postmenopausal women. Estrogen levels begin to decrease around the time of menopause, which may exert an effect on cough reflex sensitivity.

Adapted from: Sundar KM, Daly SE. [Chronic cough and OSA: a new association?](#) *J Clin Sleep Med.* 2011 Dec 15;7(6):669-77. doi: 10.5664/jcsm.1482. PMID: 22171209; PMCID: PMC3227716.

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Additional Reading

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