CLINICAL VIGNETTE

Opiate Induced Worsening of Sleep Apnea Noted on CPAP Download

Alfonso J. Padilla, MD and Roman M. Culjat, MD

Case Presentation

A 37-year-old woman with a history of diabetes, depression, renal and pancreatic transplant and Charcot-arthropathy was referred to sleep clinic for follow up of an abnormal sleep study. The sleep study was ordered due to complaint of daytime sleepiness and multiple nocturnal awakenings over the previous six months. She was waking up almost every hour through the night for months. She had been started on trazodone by her primary care physician to help her sleep through the night but continued to have significant arousals. Sleep had become unrefreshing and was causing her to wake up later in the morning. On physical exam, the patient had normal vital signs except for a BMI of 32 and a Mallampati 4 airway which put her at increased risk for obstructive sleep apnea. The rest of the physical exam was unremarkable. Prior CBC and echocardiogram were normal. A home sleep apnea test showed severe obstructive sleep apnea with an Apnea-Hypopnea Index (AHI) of 31 per hour (Normal <5, Mild 5-15, Moderate 15-30, Severe >30/hr). The oxygen nadir during the study was 80% and it was associated with 13 minutes with oxygen under 88%. No significant central sleep apnea was noted on the home sleep test.

Continuous positive airway pressure (CPAP) therapy was initiated with auto-CPAP at a range of 5-12 cm H2O. The patient had a follow-up appointment with a respiratory therapist 19 days after initiation of CPAP. The download from her device showed fair compliance with 10 days of use, 4 hours of daily use, and a residual apnea hypopnea index (AHI) of 1.4 per hour which signified over 95% reduction in respiratory events per hour. The patient was scheduled for routine follow-up with the sleep medicine physician and a recommendation to increase nightly usage. At the follow-up appointment 3 weeks later, a download from her device showed a significant worsening of her residual AHI up to 23 per hour even though she had increased usage to 73% of days used, 5 hours and 42 minutes use per night over the previous 30 days. The patient was also noted to have a new splint on her left ankle. She reported a surgical procedure 2 weeks before and post-operative initiation of opiate pain medications for pain control. Opiates were not included in her medication list as the procedure was done outside of UCLA. The patient was not opiate naïve as she had multiple prior surgical procedures and previous use of opiates for pain control. The patient took oxycodone 5mg three times daily for the first week and had transitioned to hydrocodone/acetaminophen (5/325) once per night for the second week. She was scheduled to further wean over the upcoming weeks based on pain level.

A closer look at the data from the CPAP machine showed worsening of her obstructive sleep apnea and the addition of central sleep apnea coincident with the addition of opiates. The CPAP device gives a readout of likely central versus obstructive events which, while not perfect, helped clarify the clinical picture. The residual AHI on the first week after initiation of opiates showed a residual AHI of 64 per hour with 48 per hour caused by central sleep apnea. On the second and third weeks with the decrease in overall opiate dose, the residual AHI had improved to 15 per hour and 19 per hour, respectively. By the fourth week along with discontinuation of opiates, the residual AHI had returned to normal at 4 per hour.

Discussion

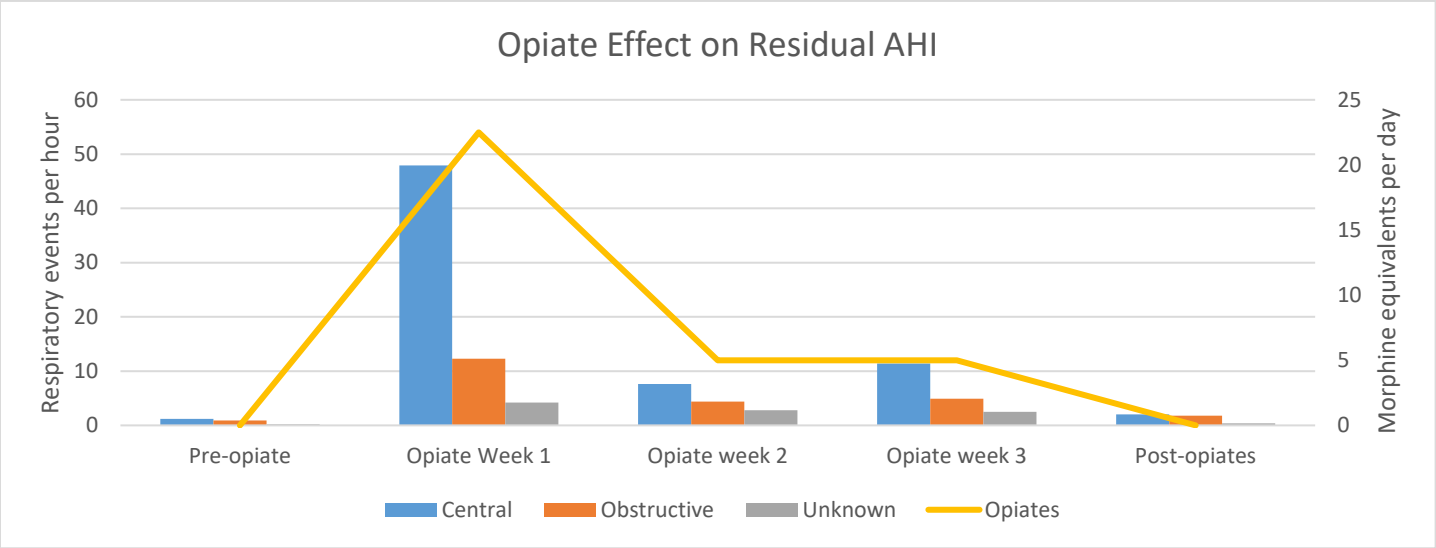
Opiates are central to the treatment of post-operative pain. Opiate medications are associated with the development of both acute and chronic respiratory complications. Known effects include worsening of obstructive sleep apnea, development of central sleep apnea, ataxic breathing, hypoxia and decreased breathing rate and tidal volume.[1-3]

Patients undergoing painful procedures discharged home on narcotic pain medications may be at higher risk of developing respiratory complications from acute opiate ingestion. Case series have established the immediate effects of appropriately dosed opioids and the development of central sleep apnea.[4] However, it is difficult to monitor the effect of acute opiate ingestion on sleep disordered breathing in outpatients. People who are already on PAP therapy for obstructive sleep apnea represent an opportunity to evaluate the effect of opiate ingestion on sleep disordered breathing.

Our patient showed a severe worsening of sleep disordered breathing with the use of opiates at normal therapeutic doses. The majority of the increase was due to central sleep apnea although she did require higher CPAP pressures and an increase in obstructive events were also noted on her device download. She also showed a return to normal baseline after the discontinuation of opiate medications. Our patient was already weaning off her opiate pain medications when she was noted to have an elevated AHI and the overall severity had decreased to less than her baseline OSA severity so close follow-up to establish a return to baseline was deemed appropriate.

In patients requiring chronic opiate therapy, CPAP by itself may not be beneficial. These patients may require the addition of advanced PAP modalities such as adaptive servo-ventilation (ASV) or Bilevel PAP with a backup rate. Opiate use in the outpatient setting is quite common. Clinicians should be aware of the potential for acute worsening of respiratory parameters in the outpatient setting including at appropriate therapeutic doses.

Patients who are starting opiate pain medications may need follow up with a sleep medicine physician to assess their data in case of a need for adjustment of PAP settings. If starting long-term opiates, especially in those with known sleep disordered breathing, patients should be followed closely for the development of worsening of their respiratory parameters. The PAP device may itself help to monitor the development of central sleep apnea in the outpatient setting in patients started on opiates.



REFERENCES

1. **Correa D, Farney RJ, Chung F, Prasad A, Lam D, Wong J**. Chronic opioid use and central sleep apnea: a review of the prevalence, mechanisms, and perioperative considerations. *Anesth Analg*. 2015 Jun;120(6):1273-85. doi: 10.1213/ANE.0000000000000672. PMID: 25988636.
2. **Yue HJ, Guilleminault C**. Opioid medication and sleep-disordered breathing. *Med Clin North Am*. 2010 May; 94(3):435-46. doi: 10.1016/j.mcna.2010.02.007. PMID: 20451025.
3. **Van Ryswyk E, Antic NA**. Opioids and Sleep-Disordered Breathing. *Chest*. 2016 Oct;150(4):934-944. doi: 10.1016/j.chest.2016.05.022. Epub 2016 Jun 1. PMID: 27262224.
4. **Mogri M, Khan MIA, Grant BJB, Mador MJ**. Central sleep apnea induced by acute ingestion of opioids. *Chest*. 2008 Jun;133(6):1484-1488. doi: 10.1378/chest.07-1891. PMID: 18574293.