# The Use of Melatonin for Insomnia in Patients with COPD

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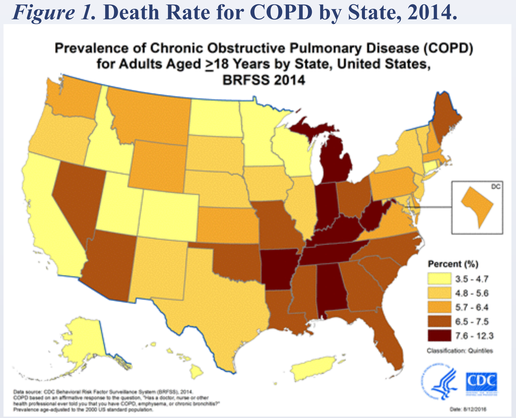
## BACKGROUND

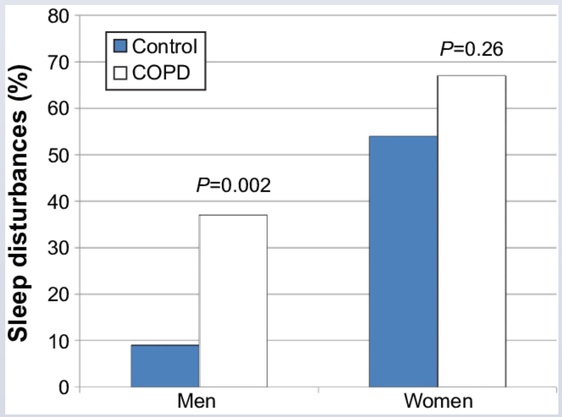
- COPD is a highly prevalent condition that is often accompanied by symptoms and secondary illnesses that impacts one's quality of life.

*Figure 1.* **Death Rate for COPD by State, 2014.**




- Sleep disturbances and insomnia are some of the many health issues that often coincide with COPD

*Figure 2.* **Reported sleep disturbances in men and women with and without COPD.**




- Common pharmacological treatments of insomnia include melatonin as well as hypnotics. Both of these medications have different mechanisms of action and side effects on individuals.

## OBJECTIVES

- Juxtapose the use of melatonin and hypnotics in COPD patients experiencing insomnia
- Compare efficacy of melatonin verse hypnotics in COPD patients
- Identify the impact these medications have on the airway disease

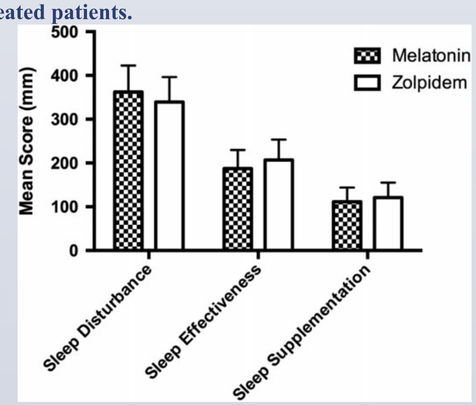
## METHODS

- A literature review began by reading the abstracts of articles obtained from extensive database searches.
- 8 keeper studies represent a variety of research designs including one meta-analysis, three randomized controlled trials, one cohort study, one case control study and two cross sectional studies
- The articles were reviewed and an analysis of the data was conducted
- Articles provided background information on COPD, insomnia, hypnotics and melatonin as well as data on the use of these mediations in COPD patients
- Findings from the articles were used to suggest practice recommendations for the treatment of insomnia in COPD patients

## RESULTS

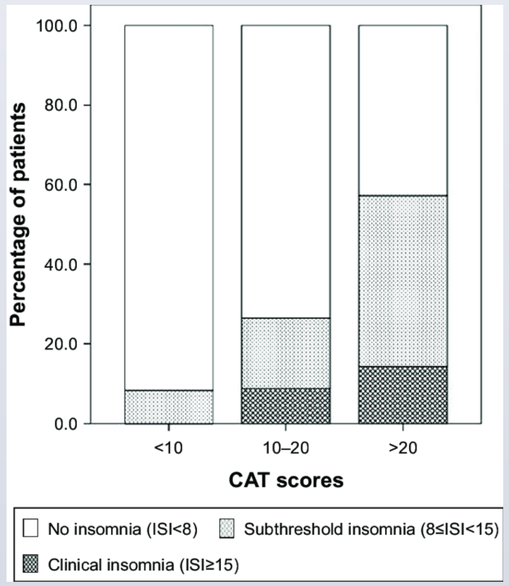
- Hynnian et al. (2013) performed a cross-sectional study which highlighted those with severe COPD had more complaints of non restorative sleep, when compared to those with mild COPD. There were also findings that insomnia multifactorial.
- Stoianovici, Brunetti, & Adams (2019) conducted a single-center, prospective, observational cohort study on COPD patients and found that both grogginess and headaches were adverse effects of zolpidem and melatonin. In comparing patient perceived sleep, there was no significant difference between zoplidem and melatonin. Thus authors recommend the safer medication, melatonin be used.

*Figure 3.* **Comparison in Verran and Snyder-Halpern sleepdomains between melatonin- and zolpidem-treated patients.**




- Chung, Lai, Lin and Kao (2015) constructed a population-based control study to evaluate the use of hypnotics and the risk of adverse respiratory effects of patients with COPD resulting in recommendation against the use of hypnotics and suggests alternative interventions to help COPD patients with insomnia.
- Halvani, Mohsenpour, & Nasiriani (2013) performed a randomized, double-blind, placebo-controlled trial involving COPD patients that demonstrated recipients of melatonin had higher PSQI scores (in sleep quality, sleep latency, sleep efficacy, and sleep duration).
- Lu, Zhu, & Zhou (2016) performed a meta-analysis using electronic databases and when benzodiazepines were compared to placebos in COPD patients, they improved quality of sleep but transcutaneous CO2 pressures elevated during sleep, suggesting risks in using benzodiazepines to treat insomnia in COPD patients
- de Matos Cavalcante, et. al (2012) constructed a randomized, double-blind, placebo controlled trail to study the effects of melatonin on COPD patients. The study demonstrated those who received melatonin had a decrease in oxidative stress highlighted by a reduction in IL-8 levels when compared to baseline levels after 2 and 3 months. Spirometry and the 6-minute walk test did not reflect changes in those using melatonin, but dyspnea was improved. Patients who received the placebo had an increase in IL-8 levels.

*Figure 4.* **Frequency of insomnia according to CAT scores.**




## CONCLUSIONS

- After reviewing and analyzing the current data here is evidence to suggest that melatonin is a safer intervention to promote sleep in patient's with COPD
- There is a need for further research in comparing the use of melatonin and hypnotics in treating insomnia in patients with COPD
- If further research on melatonin and its effects on COPD were to be conducted, more statistically significant data could support clinical recommendation for its use in COPD patients.

## RECOMMENDATIONS

- Melatonin should be the pharmacotherapy of choice for COPD patients with insomnia because of its ability to help treat insomnia, its safety in juxtaposition to hypnotics and the potential benefits it can provide patients with COPD.
- Through the analysis of studies, the dangers of hypnotics are made evident
- It should be discussed that the use of benzodiazepines was found to increase transcutaneous carbon dioxide pressure during sleep in COPD patients.
- It is also important to include data on the potential benefits of melatonin in COPD patients as this could help the patient view this medication as to not only help treat insomnia, but pose an advantage for COPD by reducing oxidative stress and dyspnea

*Figure 5.* **Chemical structure of melatonin.**

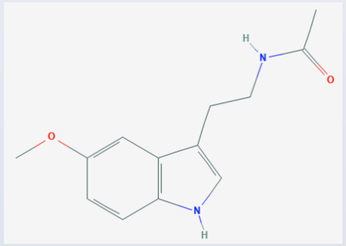



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***Figure 2***: Theorell-Haglöw, J.,Olafsdottir, I., Benediktsdottir,. B., Gislason, T., Lindberg, E. & Janson, C. (2016). Sex differences in reported and objectively measured sleep in COPD. International Journal of Chronic Obstructive Pulmonary Disease. 11. 151. 10.2147/COPD.S94268.

***Figure 3***: Stoianovici, Brunetti, & Adams (2019). Stoianovici, R., Brunetti, L., & Adams, C. D. (2019). Comparison of Melatonin and Zolpidem for Sleep in an Academic Community Hospital: An Analysis of Patient Perception and Inpatient Outcomes. Journal Of Pharmacy Practice,

***Figure 4***: Ban, W. H., Joo, H., Lim, J. U., Kang, H. H., Moon, H. S., & Lee, S. H. (2018). The relationship between sleep disturbance and health status in patients with COPD. International *Journalof Chronic Obstructive Pulmonary Disease*, 13, 2049+.

***Figure 5***: National Center for Biotechnology Information. (n.d.). [Melatonin, CID=896]. Retrieved from https://pubchem.ncbi.nlm.nih.gov/compound/Melatonin