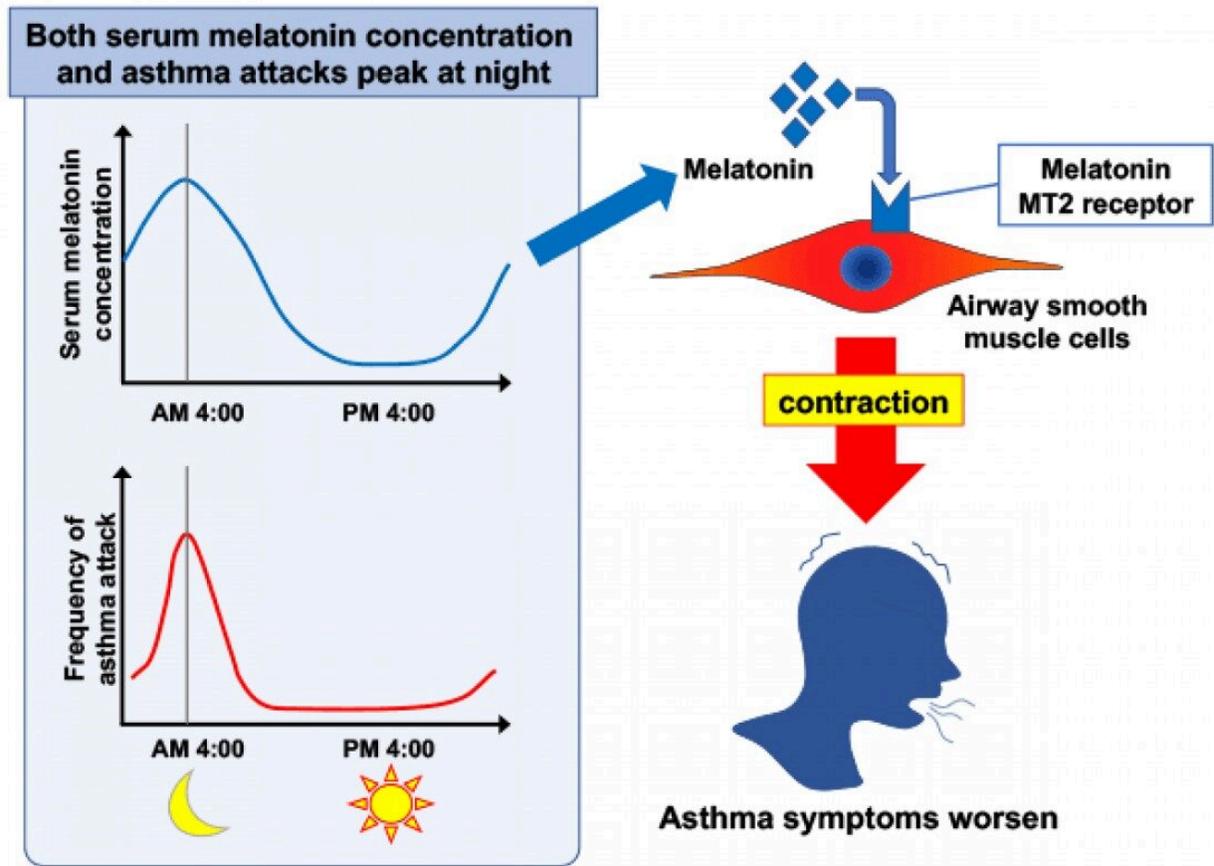


Melatonin exacerbates asthma

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The serum concentration of melatonin reaches maximum at night. Melatonin enhances airway smooth muscle contraction, which could worsen asthma symptoms. Credit: Kentaro Mizuta et al.

Asthma sufferers generally find their condition gets worse at night. Now,

a research group may understand why. Melatonin, a sleep hormone that is sometimes prescribed to treat insomnia, exasperates the constriction of the bronchus—the pathway that moves air to and from the lungs.

Patients with [asthma](#) often experience a worsening of asthmatic symptoms at night in so-called "nocturnal asthma." According to reports, more than 50 percent of asthma deaths occur at night, exposing a link between nocturnal asthma symptoms and asthma deaths. Although some have proposed several triggers that explain the pathogenesis of nocturnal asthma, the precise mechanisms regulating this asthma phenotype remain obscure.

Now, a research group led by Kentaro Mizuta from Tohoku University Graduate School of Dentistry has discovered that [melatonin](#), a sleep hormone, worsens asthma.

Asthma patients suffer from bronchoconstriction, where the smooth muscles of the bronchus—the pathway that moves air to and from your lungs—contract. To ease this, many take a bronchodilator, a medicine which widens the bronchus.

However, melatonin, which is often prescribed for insomnia, favors a state of bronchoconstriction and weakens the relaxing effect of a bronchodilator through the activation of the melatonin MT2 receptor.

To elucidate this, the research group identified the expression of the melatonin MT2 receptor in human airway smooth muscle. They observed that the activation of the melatonin MT2 receptor with higher doses of melatonin or melatonin receptor agonist ramelteon greatly potentiated the bronchoconstriction. Furthermore, melatonin attenuated the relaxing effects of the widely used bronchodilator β -adrenoceptor agonist.

"Although serum concentration of melatonin did not significantly induce the airway constriction, greater doses of melatonin, which is clinically used to treat insomnia, jet lag, or cancer, worsened asthma symptoms and impaired the therapeutic effect of bronchodilators," said Mizuta.

First author of the paper Haruka Sasaki adds, "The pharmacological therapy that blocks the melatonin MT2 receptor could inhibit the detrimental effects of melatonin on airways."

The [research paper](#) was published in the *American Journal of Physiology-Lung Cellular and Molecular Physiology* on November 16, 2021.

More information: Haruka Sasaki et al, Melatonin MT2 receptor is expressed and potentiates contraction in human airway smooth muscle, *American Journal of Physiology-Lung Cellular and Molecular Physiology* (2021). [DOI: 10.1152/ajplung.00273.2021](https://doi.org/10.1152/ajplung.00273.2021)

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