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Respir Physiol Neurobiol. 2014 Jan 1;190:20-4. doi: 10.1016/j.resp.2013.10.001. Epub 2013 Oct 11.

Intranodose ganglion injections of dronabinol attenuate serotonin-induced apnea in Sprague-Dawley rat.

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Abstract

Obstructive sleep apnea represents a significant public health concern. Afferent vagal activation is implicated in increased apnea susceptibility by reducing upper airway muscle tone via activation of serotonin receptors in the nodose ganglia. Previous investigations demonstrated that systemically administered cannabinoids can be used therapeutically to decrease the apnea/hypopnea index in rats and in humans. However, cannabinoids have effects on both the central and peripheral nervous systems, and the exact mechanism of decreased apnea/hypopnea index with cannabinoids is unknown. Here, we hypothesized that intranodose ganglion injections of a cannabinoid will attenuate 5-HT-induced reflex apnea and increase upper airway muscle tone. We show that dronabinol injected locally into the nodose ganglia suppresses 5-HT-induced reflex apnea, and increases phasic, but not tonic, activation of the genioglossus. These data support the view that dronabinol stabilizes respiratory pattern and augments upper airway muscles by acting at the nodose ganglia. These findings underscore a therapeutic potential of dronabinol for the treatment of obstructive sleep apnea.

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KEYWORDS: Cannabinoids; Dronabinol; Genioglossus; Nodose ganglia; OSA; Serotonin

PMID: 24121138 PMCID: PMC3880550 DOI: 10.1016/j.resp.2013.10.001

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