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Investigating the Underlying Mechanisms Responsible for the Effectiveness of Behavioral Cough Therapy

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Introduction

Chronic cough (CC), a cough that lasts more than eight weeks, is the number one complaint of adults seeking non-emergent medical care. An estimated 20% of patients with CC do not respond to medical treatment, and are said to have refractory chronic cough (RCC). Several studies provide evidence that RCC is caused by hypersensitivity of sensory protein receptors in the airway epithelium known to regulate cough. The primary sensory receptors are the transient receptor potential vanilloid (TRPV1-8). These receptors can be found in the epithelial layer of the bronchus, larynx and nose. These receptors are very plastic; in other words they are easily influenced by endogenous and exogenous factors, such as inflammation and chemical or mechanical stimulation. Behavioral cough therapy (BCT), which is provided by speech-language pathologists, has been shown to result in reduced cough sensitivity. However, the underlying mechanism that results in reduced cough sensitivity is unknown.

Hypothesis

The reduction in cough sensitivity is due to down-modulation of TRPV receptors through a neuroplastic mechanism.

Methods

1. Obtain biopsy of nose and larynx epithelial tissue pre-BCT
2. Analyze TRPV protein expression and subtype via Western
3. Analyze expression of TRPV mRNA via qPCR
4. Patients complete 3-4 weeks of BCT
5. Repeat steps 1-4 post-BCT, establish methods

Rationale

- Establish feasible methods
- Explore neuroplastic mechanism of reducing cough hypersensitivity

References


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