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Use of Capsaicin for Desensitization of the Cough Reflex

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VOICES (Voice Outcomes and Inquiry of Cough and Essentials in Swallowing) Lab

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Introduction

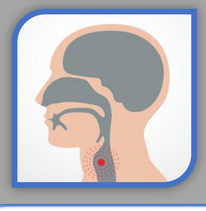
About 10-20% of patients who suffer from chronic cough do not respond to medical treatment[4]. They are said to have refractory chronic cough (RCC). Research has shown the underlying cause of RCC in many patients is hypersensitivity in the airway leading this subset of cough to be called cough hypersensitivity syndrome (CHS)[3]. Many patients with CHS are successfully treated with behavioral cough suppression therapy (BCST). BCST primarily consists of suppressing the cough. Within 2-4 weeks the sensitivity returns to normal. Experts theorize the change is due to the use-it or lose-it principle of neuroplasticity[1]. Although BCST is an effective treatment in up to 88% of patients with RCC[4], some patients have such a strong urge-to -cough (UTC) they cannot suppress it at all. We hypothesize these patients would benefit from BCST is they could be presented with cough stimulant strong enough to elicit UTC but weak enough for cough suppression.

Purpose

The purpose of this study was to determine feasibility of decreasing cough sensitivity through use of cough suppression strategies following inhalation of capsaicin in gradually increasing doses, across repeated treatment sessions.

Research Question

Is it possible to decrease cough sensitivity by exposing patients to increasing doses of aerosolized capsaicin (a known cough stimulant) combined with active cough suppression?



Methods

Baseline Testing

- Determine cough sensitivity on healthy control: by measuring the amount of inhaled capsaicin that causes two coughs (C2) and five coughs (C5)[2]
- Teach behavioral cough suppression techniques (BCST) ask participants to practice relaxed throat breathing twice a day

Treatment Sessions

- 3x/week for two weeks
- Practice BCST following inhalation of capsaicin at increasing doses

Post-treatment Testing

- Retest cough sensitivity one week and three weeks post-treatment

Cough Suppression Strategies

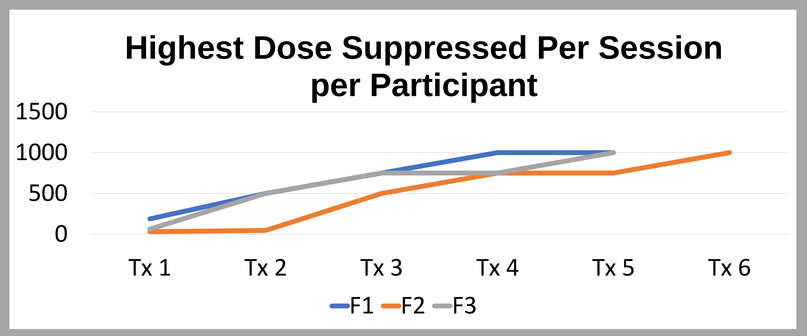
- **relaxed/open throat breathing**
- sip water
- hard swallow
- breath hold

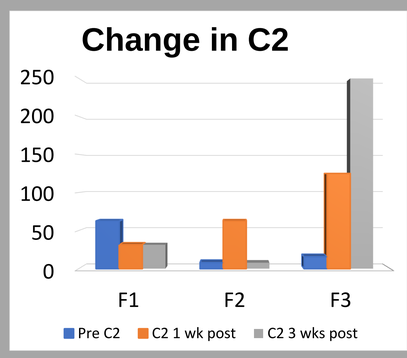
Participants

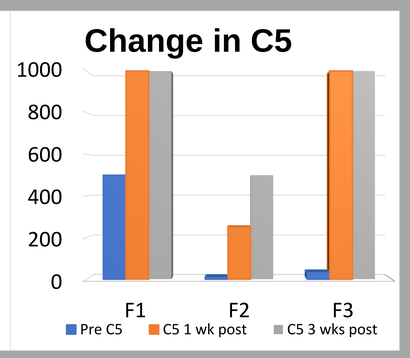
3 healthy controls (no respiratory issues) recruited from CSD department

Results

All 3 subjects were able to successfully suppress their cough at the highest capsaicin dose (1000 uM) after treatment sessions. Post-treatment testing 1 week following treatment revealed a significant decrease in cough sensitivity for all 3 participants. In general C2 did not change as much as C5.







Future Directions

This study shows feasibility of testing programmatic desensitization coupled with cough suppression in a larger sample with a placebo group. Similar results in a larger sample with placebo will provide a rationale for testing on patients with CHS. Ultimately, if this treatment works, it could significantly change how CHS is treated in the future.

References

Funding from UM University Grant Program

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