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Cough Desensitization Treatment: Combination of Desensitization and Cough Suppression

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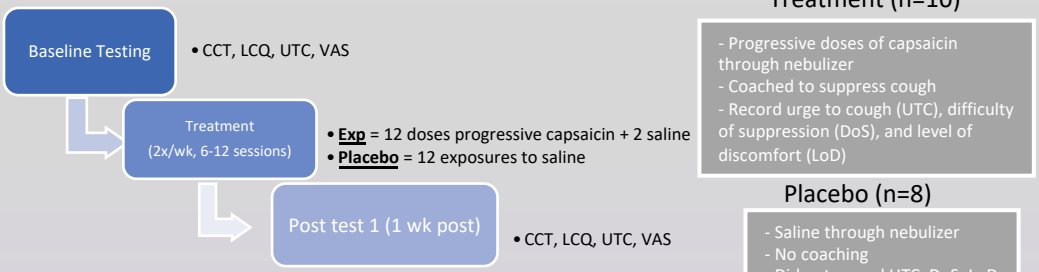
Introduction/Objective

Chronic cough (CC), a cough that persists longer than 8 weeks, impacts 11% of Americans. 15-20% do not respond to standard medical treatment and are diagnosed with refractory chronic cough (RCC). Most of these patients suffer from RCC due to hypersensitivity of airway sensory nerves. The objective of this study is to assess validity of a new treatment for RCC called cough desensitization treatment (CDT). CDT involves exposing patients to aerosolized capsaicin, a known cough stimulant found within chili peppers, in increasing doses while actively suppressing cough.

Methodology



Treatment (n=10)

- Progressive doses of capsaicin through nebulizer
- Coached to suppress cough
- Record urge to cough (UTC), difficulty of suppression (DoS), and level of discomfort (LoD)

Placebo (n=8)

- Saline through nebulizer
- No coaching
- Did not record UTC, DoS, LoD

Research Design

Single blind RCT clinical trial

Outcome Measures

CCT (cough challenge testing) - concentration of capsaicin that causes 5+ coughs (C5), without trying to suppress; increased C5=reduced cough sensitivity

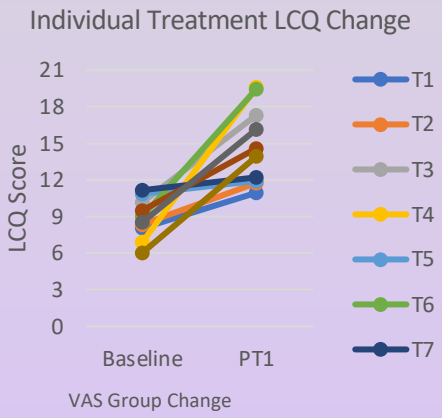
LCQ (Leicester Cough Questionnaire) - 19 questions about cough and QOL; max score=21; higher score=less impact on QOL

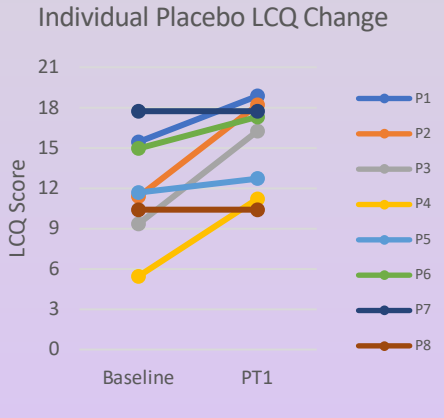
UTC (urge-to-cough testing) - cough frequency and UTC from 0 (no UTC) to 10 (max UTC) after exposure to several odors and vocal tasks. Reduction in both suggests reduced cough sensitivity

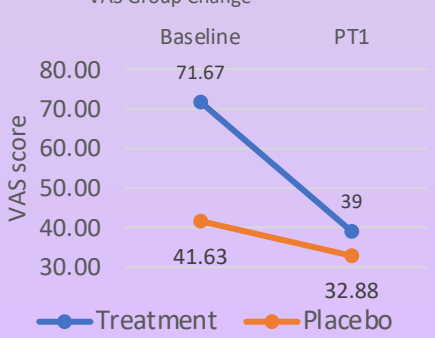
VAS (visual analog scale of cough severity) - 0-100; lower score=less severe

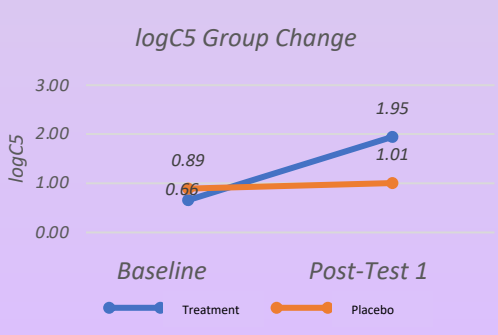
Results/Analysis

A one-way analysis of covariance (ANCOVA), with baseline scores as the covariate, was used to evaluate the group mean differences in LCQ scores and cough sensitivity (i.e., logC5) at post-test 1. There was not a statistically significant difference in LCQ scores between the groups (p=.67 partial h2=.012), but there was a statistically significant difference between the groups on logC5 (p=.01 partial eta2=.36) with a large effect size. Assumptions for a one-way ANCOVA were not met for the VAS data so an independent samples t-test comparing change in group means was run. The difference in VAS scores between the treatment and placebo groups neared statistical significance (p=.055, partial h2=.983) with a very large effect size.









Conclusion

The use of capsaicin to desensitize the airway paired with behavioral cough suppression therapy is a promising treatment for those with chronic cough. 8 out of 10 patients in the treatment group had clinically significant improvement in their LCQ, with two patients improving by 10+ points. There is strong evidence that there was greater improvement in the treatment group's cough-reflex threshold compared to the placebo group. This means that the treatment group was more desensitized at post-test 1 and could withstand more capsaicin. The mean VAS change reported in the treatment group was four times greater than that reported in the placebo group, with large effect sizes. There is strong evidence to show that the placebo group improved as well. We are unsure of this is due solely to placebo effects or if it is a possible treatment effect.

Future Directions

Plans for a multi-site study trial with the University of Colorado, Emory University, and the University of Utah are underway.