European Cystic Fibrosis Society

Journal of Cystic Fibrosis
The Official Journal of the European Cystic Fibrosis Society

Cystic Fibrosis Research News

Title:
Olfactory Dysfunction in Cystic Fibrosis: Impact of CFTR Modulator Therapy

Lay Title:
Sense of Smell in People with Cystic Fibrosis: Impact of Modulator Therapy

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What was your research question?
Limitations in sense of smell (olfaction) are common in people with cystic fibrosis (CF). This study evaluated the effect of elexacaftor/tezacaftor/ivacaftor on sense of smell in adults with CF.

Why is this important?
Decreased ability to smell is associated with lower quality of life and depression, can affect eating preference, and is even associated with shorter lifespan in the general population. Prior work has shown that many individuals with CF have a decreased sense of smell. Elexacaftor/tezacaftor/ivacaftor leads to major improvements in many aspects of CF including

lung function, sweat chloride, and sinus inflammation amongst others, but it is unknown if this treatment improves sense of smell.

What did you do?

Adults with CF and sinus disease were enrolled in a study after they decided with their CF care team to initiate elexacaftor/tezacaftor/ivacaftor. Three measures of smell function were assessed before participants started therapy and after six months of treatment. These measures were 1) an established test that calculates how accurately one identities specific smells, 2) a survey that evaluated the effect of smell loss on one's life, and 3) inflammation at the top part of the inside of the nose near where the smell pathway begins to send signals to the brain (assessed by computed tomography scan).

What did you find?

Twenty-five people completed the study. On average, people in the study had a decreased sense of smell at the start of the study. After treatment with elexacaftor/tezacaftor/ivacaftor, ability to smell did not improve meaningfully across any of the three measures. After treatment, there was a mild worsening of the ability to accurately identify smells, a mild but non-clinically significant improvement in quality of life related to sense of smell, and no change in inflammation of the top-most part of the nose near the start of the smell nerve pathway.

What does this mean and reasons for caution?

These findings confirm that people with CF have decreased ability to smell and show that treatment with six months of elexacaftor/tezacaftor/ivacaftor in adults did not lead to improvements in this smell ability. While this medication regimen leads to substantial improvements in other aspects of CF, these effects do not appear to extend to sense of smell in adults with this length of treatment. While the reasons behind these findings were not assessed in this current study, the lack of improvement in sense of smell may have to do with longstanding inflammation from sinus disease injuring smell nerves.

What's next?

Future work will include evaluating the effect of a longer duration of elexacaftor/tezacaftor/ivacaftor on smell function, assessing if ability to smell is improved with modulator therapy in younger individuals, and exploring reasons behind smell loss.

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Original manuscript citation in PubMed
https://pubmed.ncbi.nlm.nih.gov/34598881/