

Cystic Fibrosis Research News

Title:

A Four Week Trial of Hypertonic Saline in Children with Mild Cystic Fibrosis Lung Disease: Effect on Mucociliary Clearance and Clinical Outcomes

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What was your research question?

Does hypertonic saline cause a prolonged improvement in mucus clearance rates in young people with CF and mild lung disease, like has been shown in older and sicker people with CF, or will the effect be short, like observed in people without CF?

Why is this important?

Hypertonic saline has been shown to markedly improve mucus clearance rates and reduce pulmonary exacerbations in studies that primarily involved CF adults. However, in multiple studies of young CF children, exacerbations were not reduced despite showing improvements in lung function. Because of the inability of people with CF to properly clear mucus, it may allow chronic infections to develop and make people with CF vulnerable to pulmonary exacerbations. Knowing whether hypertonic saline causes significant improvements in mucus clearance in young, mildly affected people with CF might help us understand how helpful this treatment is in people with mild CF who often have few symptoms.

What did you do?

We studied CF children (between 5 and 17) with mild lung disease who were stable. Some children (n=14) were randomly assigned to receive hypertonic saline treatment (6% sodium chloride) three times daily for 4 weeks with an eFlow nebulizer, while the rest received a low salt “placebo” treatment (n=9). We made direct measurements of mucus clearance rates using inhaled radioactive particles, along with routine lung function and symptom measurements.

What did you find?



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Study participants tolerated these treatments well, with only one child withdrawing because of the salty taste of hypertonic saline. In the group receiving hypertonic saline, mucus clearance rates were significantly faster at the end of the 4-week treatment period. Because this measurement was made about 12 hours after the last dose of the study treatment, we know the effect of hypertonic saline was long lasting when used in this way. Although lung function and symptom scores also went up in the hypertonic saline group, these changes weren't significant in such a small group of people.

What does this mean and reasons for caution?

These results suggest that hypertonic saline may provide sustained improvement in mucus clearance in young people with CF with few symptoms and good lung function. This might also mean that children treated with hypertonic saline are less vulnerable for a pulmonary exacerbation. However, this study was quite small and the connection between mucus clearance rates and the risk for pulmonary exacerbations hasn't been proven. Finally, the dose of hypertonic saline used in the study (3 times a day, using a more efficient nebulizer) was higher than what most people with CF typically use at home.

What's next?

As more treatment options are becoming available to CF children, including CFTR modulators, an important next step is to determine whether hypertonic saline provides benefit when added to these new medications, or whether this more time-consuming treatment might be safely withheld in some cases.

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