European Cystic Fibrosis Society

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

Cystic Fibrosis Research News

Title:

CFTR Plays an Important Role in the Regulation of Vascular Resistance and High-Fructose/Salt-Diet Induced Hypertension in Mice

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What was your research question?

Cystic fibrosis (CF) is caused by mutations in the gene that produces the CF transmembrane conductance regulator (CFTR) protein. Our research was designed to answer two very important questions: 1) What does the CFTR gene do in controlling our blood pressure? 2) Does *CFTR* play an important part in high blood pressure (hypertension) caused by consuming high–fructose/salt-food?

Why is this important?

More problems of the heart and vessels have been found in people with CF. But, we don't know whether these problems are caused by CFTR gene problems. It has also been found that consumption of high–sugars (fructose)/salt-food such as soft drinks can cause hypertension but we don't know exactly why. Our study found that consuming high–fructose/salt-food decreased *CFTR* in blood vessels which is an important cause of hypertension. Therefore, people with CF may be at high risk for hypertension especially when they consume high–fructose/salt-food. Increase in CFTR function may be a good way to prevent and treat high-fructose/salt-food caused hypertension.

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What did you do?

Blood pressure was measured with a computer-assisted system for 60 seconds every hour for a 24-hour period on each Friday for 8 weeks from freely-moving *mice without CF*, fed with normal or high-fructose/salt-food. Function of the vessels (arteries) was examined using ultrasound. CFTR gene and protein levels in arteries and kidneys were checked in these mice.

What did you find?

1) The blood vessel stiffness, daytime and night-time blood pressure of the mice with CF were markedly higher than those in the mice without CF, with the same age- and sex.
2) The blood vessel stiffness, daytime and night-time blood pressure of mice without CF and fed with high-fructose/salt-food were all higher than those fed with normal food.
3) Importantly, high-fructose/salt-food caused a marked decrease in gene and protein expression of *CFTR* in arteries, but not in the kidney.

What does this mean and reasons for caution?

These findings tell us that CFTR plays an important role in the control of hypertension. The decrease in CFTR function may cause hypertension. Consumption of high-fructose/salt-food decreased gene and protein expression of *CFTR* and related genes in blood vessels (e.g. arteries) and caused hypertension. Therefore, although more studies in human are needed, people with CF should be cautious when taking high-fructose/salt-food such as soft drinks or fruit juices.

What's next?

1) To closely monitor the blood pressure of people with CF, especially those who may regularly consume high-fructose/salt-food.
2) To find out ways to increase CFTR activity as new methods aimed to prevent and treat hypertension caused by consuming high-fructose/salt-foods.

Original manuscript citation in PubMed

https://pubmed.ncbi.nlm.nih.gov/33279469/

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