Cystic Fibrosis Research News

Title:

Correlation between trough concentration and AUC for elexacaftor, tezacaftor and ivacaftor

Lay Title:

Correlation between trough concentration and exposure during the day for elexacaftor, tezacaftor and ivacaftor

Authors:

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What was your research question?

Is there a correlation between a trough concentration, this is one blood concentration just before the dose, and the exposure calculated from several blood samples during the day for elexacaftor, tezacaftor and ivacaftor (ETI)?

Why is this important?

In specific people with cystic fibrosis (CF) measuring drug concentrations in blood could be useful to optimise treatment, for example: to evaluate interactions between drugs, adherence, side effects and/or no clinical efficacy. Normally multiple blood samples during one day are needed to determine the exposure of a drug. However, this can be invasive, as the patient has to be admitted to the hospital for several hours. Therefore, we investigated if there is a correlation between the trough concentration (one blood sample), and the calculated exposure (from several blood samples). If a correlation was found, the number of blood samples could be reduced in order to determine the exposure.

What did you do?

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In a previous study we measured ETI blood concentrations in seven people with CF and liver cirrhosis. ETI was started in several dosing steps, starting with the lowest dose and increasing slowly. During each dosing step ETI blood concentrations were taken just before the dose (trough blood concentration), and 2, 4, 6 and 8 hours after the dose in order to calculate the exposure. In total 93 ETI blood concentrations were measured, of which 18 trough blood concentrations.

What did you find?
We found a very strong correlation between the trough concentration and the exposure for all drugs in ETI.

What does this mean and reasons for caution?
The trough concentration could be a good predictor of the exposure of ETI. Based on these findings, the number of blood samples per patient may be reduced, as the exposure of ETI may be monitored by taking just one trough sample. At this moment these results need to be taken with some caution, as there were only seven people with CF included.

What's next?
More research is needed to confirm these findings in a larger group of people with CF.

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