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Cystic Fibrosis Research News

Title:
Neutrophil respiratory burst activity is not exaggerated in cystic fibrosis

Lay Title:
Neutrophils do not produce more oxidants when stimulated to fight infections in cystic fibrosis

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What was your research question?
Neutrophils produce damaging oxidants as part of their attempt to kill and clear bacteria. An excess of these oxidants is found in the lungs of children with CF and contribute to progressive CF lung disease. We wanted to see whether neutrophils from people with CF produced more oxidants when activated.

Why is this important?
There is no doubt that oxidants from neutrophils contribute to progressive lung disease in people with CF. The big question is why this occurs. Neutrophils are an important part of the body defence against infection, so some neutrophil activation is necessary. In CF, too much neutrophil activation occurs with excessive production of damaging oxidants. Understanding why and how this occurs may allow new treatments to be developed to limit oxidant damage in the lungs of people with CF.

What did you do?
We collected blood from adults and children with CF, healthy controls and some children with other lung diseases. We attempted to collect blood when people with CF were well (at clinic),

on admission to hospital with a pulmonary exacerbation, and when ready for discharge. We then isolated the neutrophils in the lab, activated them using bacterial components and measured how much oxidant they produced. We analysed samples from children and adults separately as the adults were generally sicker than the children and this may influence the results.

What did you find?

We found that neutrophils from people with CF did not produce more oxidants and neutrophils from people without CF. Neutrophils from children with CF produced slightly less oxidants than those from children without CF. There was also no difference in oxidant production from neutrophils when people with CF were sick.

What does this mean and reasons for caution?

These findings mean that we can't simply blame neutrophils for progressive CF lung disease. We all need functional neutrophils. Our study can't explain why neutrophils are not more effective at killing and clearing bacteria from the lungs of people with CF.

What's next?

We next want to see what is responsible for controlling neutrophils in the lungs and to see whether there is something there that is not working in the lungs of people with CF.

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