European Cystic Fibrosis Society

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

Cystic Fibrosis Research News

Title:

The implications of dysglycaemia on aerobic exercise and ventilatory function in cystic fibrosis

Authors:

Adam J. Causer[a,b], Janis K. Shute[c], Michael H. Cummings[d], Anthony I. Shepherd[a], Samuel R. Wallbanks[a], Mark I. Allenby[b], Irantzu Arregui-Fresneda[b], Victoria Bright[b], Mary P. Carroll[b], Gary Connett[e], Thomas Daniels[b], Tom Meredith[b], and Zoe L. Saynor[a,b]

Affiliations:

[a] Department of Sport and Exercise Science, Faculty of Science, University of Portsmouth, Portsmouth, UK;
[b] Cystic Fibrosis Unit, University Hospital Southampton NHS Foundation Trust, Southampton, UK;
[c] School of Pharmacy and Biomedical Sciences, Faculty of Science, University of Portsmouth, Portsmouth, UK;
[d] Department of Diabetes and Endocrinology, Queen Alexandra Hospital, Portsmouth, UK;
[e] National Institute for Health Research, Southampton Biomedical Research Centre, Southampton Children's Hospital, UK

What was your research question?

Are people with cystic fibrosis (CF)-related diabetes (CFRD) less fit than people with CF and normal blood sugar control? How does lung function in people with CFRD affect their aerobic exercise compared to people with CF and normal blood sugar control?

Why is this important?

Assessing aerobic fitness is valuable in people with CF, since higher levels are associated with a better quality of life, fewer hospital stays, as well as living longer. A previous study in children with CF showed that having diabetes was related to lower fitness, however it was not known whether this relationship was the same in adults. As adults with CF may well have lower lung function and more advanced diabetes, both of which have the potential to limit their ability to exercise, understanding how individually these aspects of CF may lower fitness is important.

What did you do?

We tested the lung function and glucose control of 46 adults with CF from our outpatient clinic; 19 presented with CFRD, 8 of them had impaired glucose tolerance (IGT) and 19 had

normal glucose tolerance (NGT). They were also asked to perform maximal cardiopulmonary exercise testing on an exercise bike, from which we were able to tell how fit they are and also how well their lungs, heart and muscles were working. With this information, we were then able to explore any links between glucose control and fitness, as well as the mechanisms that determine fitness.

What did you find?

It was shown that both people with CF who had CFRD and people with CF and IGT were less aerobically fit than their peers (matched for age and gender) with NGT. This was because the group with IGT had poorer lung function than the normal glucose control group. Another important finding was that 84% of people with CFRD stopped exercising because of a problem relating to their breathing (i.e. they could not meet the oxygen delivery demands); whereas, this was only seen in 37% of people with NGT.

What does this mean and reasons for caution?

The findings from this study add to those previously observed in children with CF. That is, people with CF who cannot control their blood sugars very well are likely to be less fit. This is because have they significantly worse lung function and are limited by their breathing during exercise. It should be cautioned that we did not objectively measure the physical activity of our participants. Because of this, we do not know whether people with CF and normal glucose control have better blood sugar control because they exercise more. This would also mean they are likely to be fitter.

What's next?

Though we have now confirmed that people with CFRD tend to be less fit, we still do not understand why. We know that poor blood sugar control can damage the blood vessels. This might cause reduced oxygen supply to the muscle. We do not know whether exercise can improve the health of people with CFRD.

Original manuscript citation in PubMed

https://pubmed.ncbi.nlm.nih.gov/31685399/

cfresearchnews@gmail.com