

ePS3.03 Ventilatory parameters during cardiopulmonary exercise testing (CPET) in people with Cystic Fibrosis-Related Diabetes (CFRD): a potential barrier to exercise?

T. Meredith¹, V. Bright¹, A. Causer², S. Janis², M. Cummings³, A. Shepherd², M. Allenby¹, I. Arregui-Fresneda¹, M. Carroll¹, T. Daniels¹, G. Connett¹, Z. Saynor².

1 Southampton University Hospitals Nhs Trust, Southampton, United Kingdom; 2 University of Portsmouth, Portsmouth, United Kingdom; 3 Queen Alexandra Hospital, Portsmouth, United Kingdom

Objectives: Ventilatory parameters during CPET are important in people with cystic fibrosis (CF). They are associated with prognosis and help guide exercise prescriptions. CFRD is associated with worse prognosis and poorer lung function. However, little is known about how CF-related dysglycaemia affects ventilatory function during exercise. This study aimed to investigate ventilatory parameters during CPET across the dysglycaemic spectrum of CF.

Methods: 76 people with CF (18 paediatric with normal glucose tolerance [NGT], 30 adults with NGT, 9 adults with impaired glucose tolerance [IGT] and 19 adults with CFRD) completed a combined ramp incremental and supramaximal verification cycle test to determine maximal O₂ uptake ($\dot{V}O_{2max}$), ventilatory drive ($\Delta VE/\Delta V CO_2$), breathing reserve (VE/MVV), peak ventilatory equivalents for O₂ ($VE/V O_{2peak}$) and CO₂ ($VE/V CO_{2peak}$), change in arterial O₂ saturation (ΔSpO_2) and peak dyspnoea.

Results: $\dot{V}O_{2max}$ relative to body mass was significantly different between groups ($p < 0.02$, $n_2 > 0.13$), with the paediatric NGT group having a significantly higher $\dot{V}O_{2max}$ compared to adults with CFRD ($+2.86 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$, $p < 0.05$). A moderate effect size was observed between groups for VE/MVV ($p = 0.05$, $n_2 > 0.10$), but not $\Delta VE/\Delta V CO_2$ ($p > 0.05$, $n_2 < 0.01$), $VE/V O_{2peak}$ ($p > 0.05$, $n_2 = 0.01$) or $VE/V CO_{2peak}$ ($p > 0.05$, $n_2 = 0.05$). There were significant negative and positive correlations between VE/MVV and ΔSpO_2 ($r = -0.31$, $p = 0.01$), and VE/MVV and peak dyspnoea (adult data only; $r = 0.34$, $p = 0.01$) respectively.

Conclusion: More adults with CFRD experienced ventilatory limitation during exhaustive CPET compared to their NGT peers. The implications of these observations are unknown. However, associations between VE/MVV , ΔSpO_2 , and dyspnoea at exhaustion may implicate ventilatory abnormalities as a potential barrier to exercise in people with CFRD and may need consideration when prescribing exercise.