Sex and age differences in aerobic fitness in people with cystic fibrosis

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Objective: A high exercise capacity (VO) is known to be a predictor of mortality independent of lung function for people with CF (PwCF). Whilst VO has been shown to be significantly different between sexes in healthy children, it is unclear what the effects of age and sex are for VO in PwCF. This aim of the study was to characterise CPET results for PwCF.

Methods: Eighty-nine people with CF (53 male/36 female; age range 9-69 y; paediatric (< 18 y = 31, Adult ≥18 y = 58; ∆F508/∆F508 = 38, ∆F508/Other = 46, No ∆F508 = 10) were included. CPET using a combined ramp-incremental and supramaximal verification cycle ergometer test determined maximal oxygen uptake (VO). Absolute, relative to body mass and allometrically scaled VO were derived. One way ANOVA with Bonferroni post-hoc tests compared age and sex differences.

Results: Mean (SD) absolute VO male (n=19) and female (n=12) paediatrics were 2.19 (0.84) and 1.31 (0.34) L·min respectively and adult males (n=34) and females (n=24) were 2.12 (0.66) and 1.44 (0.36) L·min respectively. Mean (SD) relative VO for male and female (n=12) paediatrics were 38.9 (6.3) and 28.6 (5.4) mL·kg⁻¹·min respectively and adult males and females were 28.4 (9.1) and 22.7 (5.0) mL·kg⁻¹·min respectively. Mean (SD) allometrically scaled VO for male and female paediatrics were 79.6 (14.9) and 56.8 (10.3) mL·kg⁻¹·min and adult males and females were 61.6 (19.4) and 47.9 (10.4) mL·kg⁻¹·min respectively. A significant main effect for sex (P< 0.01) but no age (P=0.82) or interaction (P=0.48) effect was found for absolute VO. Relative and allometrically scaled VO, significant sex and age main effects (P< 0.01) but no interaction effects were found (P=0.16 and P=0.20).

Conclusion: Mean female VO scores were significantly lower than males irrespective of age and paediatric scores were significantly higher than adults. Of concern is the significantly reduced scores in adulthood for females.