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Does exercise training improve cardio-respiratory fitness and daily physical activity in adolescents with corrected tetralogy of Fallot or Fontan circulation? A randomized controlled trial.

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Introduction: Current public-health guidelines suggest >60 minutes of moderate-to-vigorous daily physical activity for adolescents. Many adolescents with congenital heart disease do not meet these guidelines. We hypothesized that exercise training would increase cardio-respiratory fitness and daily physical activity. We assessed the effects of an exercise-training program on cardio-respiratory fitness and daily physical activity in patients with corrected tetralogy of Fallot (ToF) or Fontan circulation. **Methods:** A multi-center prospective, randomized controlled trial design was used. Patients with ToF or Fontan circulation (age range 10-25 years) were randomized. The intervention group participated in a 12 week standardized aerobic exercise-training program. The control group did not change their lifestyle. Cardiopulmonary exercise-testing and activity measurements were performed before and after a 12 week period.

Results: Nine-three patients participated, 56 in the exercise group. 37 in the control group. PeakVO₂ increased in the exercise-group by 5.0% (1.7±4.2 ml/kg/min, p=0.011), in the control-group by 2.7% (0.9±5.2 ml/kg/min, p=not significant) (p=not significant between the groups). Increase in peak workload was significant (6.9±11.8 Watt vs. 0.8±13.9 Watt; p=0.047) Time spent in moderate to very vigorous activity at baseline was 13.6±8.6%, which did not significantly change after training. Subgroup analysis showed a significant increase in the pre-to-post peakVO₂ in ToF, not in Fontan patients.

Conclusions: Aerobic exercise training improved cardio-respiratory fitness in patients with tetralogy of Fallot but not in patients with a Fontan circulation. Exercise training did not significantly change daily physical activity.

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