

**The effect of exercise training on cardiac remodelling in adolescents with corrected tetralogy of Fallot and Fontan circulation: a randomized control trial.**

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**Introduction:** Exercise can improve physical fitness in children and adults with congenital heart disease. Cardiac effects have hardly been studied. We hypothesized that exercise training would not lead to adverse cardiac remodelling.

**Methods:** This multi-centre randomized controlled trial included adolescents (10 to 25 years) with either corrected tetralogy of Fallot or Fontan circulation. The exercise-group was enrolled in a 12 week standardized aerobic dynamic exercise training program. The control-group continued their life-style as usual. Both groups underwent cardiopulmonary exercise testing, cardiac magnetic resonance imaging (MRI), echocardiography and neurohormonal assessment, 2 weeks before and within 2 weeks after the intervention period.

**Results:** Fifty-six patients were randomized to the exercise-group, 37 to the control-group. We assessed changes between the pre-and post-intervention period for the exercise group compared to the changes in the control-group. Peak load increased significantly in the exercise-group compared to the control-group (exercise-group  $6.9 \pm 11.8$  Watt; control-group  $0.8 \pm 13.9$  Watt;  $p=0.047$ ). There were no adverse events linked to the study. Ventricular systolic parameters, cardiac dimensions and neurohormonal markers did not change during follow-up in patients allocated to the exercise-group and control-group. There were some isolated minor but statistically significant changes in inflow parameters. The pattern of these changes was not consistent, indicating a lack of true change in the diastolic function.

**Conclusion:** We demonstrated that no adverse cardiac remodelling occurred after 3 month exercise training in adolescent patients with either a corrected tetralogy of Fallot and Fontan circulation. This data may provide support for improved clinical guidelines.

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