Exercise training improves fitness without adverse cardiac remodelling in patients after repair of tetralogy of Fallot: Preliminary results of the TOFFIT study.

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OBJECTIVE: To assess a) whether aerobic exercise training (AET) improves exercise capacity and b) if AET results in adverse cardiac remodelling, in children and young adults after repair of tetralogy of Fallot (TOF).

METHODS: Design: multicenter randomized controlled trial. Forty-seven participants after repair of TOF were recruited from 5 tertiary referral centres. Participants were assigned to an interventional or control group. All underwent cardiopulmonary exercise testing and cardiac MRI before and after a 12 week period. Patients in the intervention group performed supervised aerobic exercise training (AET) for 12 weeks. AET consisted of 2 – 3 sessions/week, for 1 hour/session at an exercise level predicted by 60-70% of heart rate reserve. The control group did not change their lifestyle.

RESULTS: Preliminary results of the 47 participants after TOF repair: baseline characteristics of the intervention (AET) group (n=27): age 15.5±2.8 years; 21 males; controls (n=20): age 16.0±2.6; 12 males. After the 12 week AET program peak VO2 of the intervention group improved slightly and significantly (35.6±7.1 vs 37.8±8.1 ml/kg/min, p=0.02). In the control group no changes were noted (33.8±8.0 vs 34.8±8.0 ml/kg/min). Maximal work load of the intervention group improved significantly (170±56 vs 179±53 Watt, p=0.001). The control group did not show any change (167±36 vs 168±39 Watt). The oxygen uptake efficiency slope (OUES) did not change in either group.

Cardiac MRI did not reveal significant changes for right and left ventricular size and function in either group. For the AET TOF group vs TOF controls: RVEDV AET group: pre-intervention 127±37 vs 122±30 ml/m² post-intervention; controls 132±39 vs 130±42 ml/m². RVSV AET: pre-intervention 61±14 vs 61±14 ml/m² post-intervention; controls 66±17 vs 65±19 ml/m². RVEF AET: pre-intervention 50±9 vs 51±7% post-intervention; controls 51±7 vs 51±6%. LVEDV AET: 82±13 vs 84±21 ml/m²; controls 83±7 vs 81±12 ml/m². LVSV AET: 48±6 vs 47±6 ml/m²; controls 51±7 vs 50±9 ml/m². LVEF AET: 60±10 vs 60±9%; controls 51±7% vs 51±6%.

CONCLUSION: Aerobic exercise training improves exercise capacity of children and young adults after repair of tetralogy of Fallot. Interim analysis did not show adverse cardiac remodelling.

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