Cardiopulmonary impact of a multidisciplinary rehabilitation program implementation in children and young adults with complex congenital heart disease

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Introduction and objectives
Cardiac rehabilitation programs (CRP) improve functional capacity in post operated complex congenital heart disease (CHD) patients safely.
We implemented a multidisciplinary CRP for children and adults with complex CHD and their families to quantitatively determine its changes in cardiovascular and respiratory function.

Methods
24 patients (13 male), 7 children (8-14yo) and 17 young adults (15-35yo).
CHD included 8 post operated Tetralogy of Fallot, 1 Fontan stage, 8 TGA (4 arterial switch, 4 atrial switch), 3 PAIVS, 2 truncus arteriosus, 2 DORV.
We designed a customized cardiopulmonary rehabilitation program including respiratory physiotherapy. We performed EKG, echocardiogram, ergospirometry and 6-minute-walk test.

Results
After a mean of 21.5 ± 4 training sessions, we found statistically significant improvement in forced vital capacity (FVC, +5.6% improvement respect to baseline; p<0.01); maximal inspiratory pressure (MIP, +14.4%; p<0.05); effort time (ET, +12.7%; p<0.01); real metabolic equivalents (METs, +11.3%; p<0.05), VO2 %predicted (+3.3%; p<0.05), VO2 at anaerobic threshold (AT, +5.8%; p<0.05) and decreased VE/VCO2 slope (p<0.02). 6-minute-walk test (6MWT) mean distance increased from initial 541 ± 94meters to final 642.5 ± 87m (+18.8%; p<0.01).
Echocardiography did not show significant changes.
No adverse effects described.

Conclusions
Tailored CRP are safe and capable to improve cardiorespiratory function in children and young adults with complex CHD. We suggest the implementation of this programs as a therapeutic tool.