P-84

Impact of personalized cardiac rehabilitation programs in postoperated congenital heart disease children

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INTRODUCTION AND OBJECTIVES: Most patients with congenital heart disease (CHD) do not perform regular physical exercise. Consensus reports have stated that exercise should be encouraged and regularly performed in these patients. Postoperated children with CHD frequently associate disorders that impair their exercise capacity (ExC). We developed a personalized cardiac rehabilitation program (CRP) conceived to counteract their deconditioning.
Our aim was to characterize the effect of a personalized CRP through cardio pulmonary exercise test.

MATERIAL AND METHODS: 8 postoperated CHD patients were recruited during 2015 (ages 7-17 years): 2 heart transplants, 3 postoperated Tetralogy of Fallot, 3 Fontan procedures.
CRP started with clinical review, baseline echocardiography, submaximal ergometry and post-exercise echocardiography. These tests allowed a personalized CPR design: raining intensity was set at the transition zone between 1st and 2nd threshold. CPR consisted in 1hr supervised exercise 2-3 times/week, 3 months, including respiratory training, column table, and aerobic exercise. After CRP, tests were repeated to quantify its effects on ExC.

RESULTS: Submaximal exercise tests in treadmill (limited by symptoms, including fatige) were performed (Bruce protocol). Ergometric tests showed effort time improvement (+29%), increased METs (+7.7%) and a decrease in baseline HR, without any other significant changes.
Restrictive spirometric pattern was predominant. CPET revealed a tendency to increase VO2 in +7.4%(+2.2 ml/kg/min), oxygen pulse in +2% and a tendency to decrease O2 and CO2 equivalents. 2/8 patients had conflicting data, with decreased ExC. No adverse effects were found.

CONCLUSIONS: Despite our small smaple, a 3-month CRP could improve relevant ExC parameters. Exercise was safe and and improvement of fitness after a physical exercise training programme can be obtained. Routine use of formal CRPs might be a useful tool to reduce morbidity and improve quality of life in CHD.