Impact of exercise and cardiac rehabilitation on echocardiographic functional parameters in postoperated Tetralogy of Fallot children.

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INTRODUCTION: exercise capacity of children with congenital heart disease (CHD) is often depressed. We developed a personalized cardiac rehabilitation program (CRP) conceived to counteract the deconditioning and comorbidities associated with prolonged sedentarism and physical inactivity after cardiac surgery in children.

The objective of this study was to characterize the effect of a CRP on echocardiographic functional parameters.

METHODS: 18 postoperated Tetralogy of Fallot (POTOF) patients were recruited. Our CRP commenced with a comprehensive intake evaluation of the patient including a clinical status review, a baseline echocardiography, exercise test and a post exercise echocardiography. Documentation of nutrition, life-style and cardiac risk factors was also obtained. A supervised exercise training program with both aerobic and respiratory training components is then designed individually. After 3 months of CRP, full assessment is repited. Relevant cardiovascular outcomes of cardiac rehabilitation are classified as:

- echocardiographic systo/diastolic functional parameters pre and post CRP.
  - quality of life outcomes: individual’s perception of satisfaction with life, social functioning and general sense of well-being measured by questionnaire.
  - ergometric parameters pre/post CRP HR, BP, endurance time and double product.

RESULTS: echocardiographic baseline parameters pre and post CRP were compared. Systolic function improved. SF: mean preCRP 32%, postCRP 35.1% and mean rise +7.76%; EF: mean preCRP 63.84%, postCRP 68.8%, mean increase +5.11%; TAPSE: mean preCRP 13.2 mm, postCRP 15.95 mm, mean rise +10.2 mm; FAC: preCRP 44.5%, postCRP 59.7%, mean increase +13.14%. Mitral diastolic function improved partially while tricuspid E/E´ remained the same.

Some of the results were invalid whilst others suffered no significant changes. 83.3% of patients experienced improvement at least in one of the echocardiographic parameters studied. Only 3 children suffered worsening in diastolic function (E/E´ increase).

CONCLUSIONS: An improvement in cardiac function (quantified by echocardiography) has been demonstrated in POTOF after CRP (that includes education and counseling in addition to exercise and respiratory training). An improvement in ergometric parameters and quality of life was also assessed. Our CRP was performed in the absence of symptoms or cardiac events.