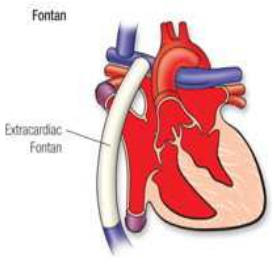
LONG-TERM FUNCTIONAL CAPACITY IN PATIENTS WITH EXTRACARDIAC FONTAN CIRCULATION

Cafiero G[1], Cantarutti N[2],Gandolfo F[3], Giordano U[1], Turchetta A[1], Giannico S[3]

Department of Pediatric Cardiology and Cardiac Surgery, Sport Medicine Unit, Bambino Gesù Children's Hospital and Research Institute [1], Department of Pediatrics , University of Rome "Tor Vergata", [2], Department of Pediatric Cardiology and Cardiac Surgery, Bambino Gesù Children's Hospital and Research Institute [3]

Background

Due to advances in cardiac surgery life expectancy of patients with congenital heart disease has considerably grown. In the last 25 years more than 400 patients underwent an extracardiac Fontan procedure in our institute. Aim of our study was to evaluate functional capacity in a group of selected patients.



Patients and Methods

This study included 136 patients following after extracardiac Fontan operation. Sample has been divided into two subgroups on the basis of months of follow-up from procedure. All patients underwent with maximal cardiopulmonary exercise test (CPET) with measurement of maximal oxygen uptake (VO2 max). The data from CPET were also calculated as a percentage of normal predicted values. Lung function test to measure forced vital capacity (FVC), forced expiratory volume in 1 sec (FEV1), and peak expiratory flow (PEF) was also performed.

	Group A	Group B	p
GENDER M/F	48/29	32/26	
AGE AT FONTAN (months)	55.85(62.32)	65.59(41.77)	0.30
CONDUIT SIZE (mm)	17.5(1.86)	19.43(1.90)	**0.01**
WEIGHT AT FONTAN	17.28(11.57)	28.5(19.79)	**0.04**
BMI	18.70(3.82)	17.44(3.77)	**0.04**
MONTHS AT FU	111.1(40.8)	240.12(40.26)	**0.001**
WEIGHT AT FU	41.37(16.7)	61.45(19.49)	**0.001**
BMI AT FU	20.10(3.44)	22.47(2.49)	**0.02**
SATURATION	95.79(2)	95.10(3.48)	0.14
NYHA	1.16(0.45)	1.35(0.64)	**0.03**

	Group A	Group B	p
TE	8.04(2.10)	8.44(2.21)	0.27
TE TEOR	14.26(1.77)	14.09(2.10)	0.6
TE%	57(15)	59.61(15.38)	0.33
BP	126.19(15.5)	137.64(19.45)	**0.001**
BP TEOR	143.81(19.41)	167.68(20.81)	**0.001**
BP%	86.38(16.87)	81.86(20.81)	0.08
H R AT PEAK (beats/min)	161.34(16.4)	157.17(17.53)	0.15
H R TEOR	190.41(6.89)	185.20(4,51)	**0.001**
H R AT PEAK (beats/min) %	84.79(9.47)	84.84(9.59)	0.97
Desaturation	0.13(0.33)	0.25(0.44)	**0.05**
VO2 ml/Kg/min	29.05(6)	24.69(5.27)	**0.01**
FVC	2.55(0.77)	3.63(1.34)	**0.001**
FVC %	82.84(17.47)	81.27(17.76)	0.66
FEV 1	2.34(0.83)	3.08(0.91)	**0.001**
FEV 1%	86.03(19.93)	83.83(15.54)	0.57
PEF	10.52(39.44)	6.38(2.33)	0.47
PEF%	85.27(22.13)	79.39(23.56)	**0.01**

The percentage of major complications after surgery were similar in both groups.

No significant differences were found for exercise tolerance. Significant difference was found in presence of oxygen desaturation, VO2 max % and PEF% ($p<0.05$) between the two groups

Conclusions

We speculate that surgical improvement in this procedure over the years is leading to a gradual improvement of the functional capacity of the patients. Further studies are needed to confirm our hypotheses.

References

- Giannico S., et al. *Clinical outcome of 193 extracardiac Fontan patients: the first 15 years.* J Am Coll Cardiol. 2006 May
- Goldberg DJ. et al. *Exercise capacity in the Fontan circulation.* Cardiol Young. 2013 Dec

Joint Commission International

Bambino Gesù
OSPEDALE PEDIATRICO