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Echocardiographic assessment of the proximal aorta after tetralogy of fallot repair

Cristina Cruz¹, Teresa Pinho², Cláudia Camila Dias², José Silva Cardoso¹ and Maria Júlia Maciel¹¹Saint John Hospital, Portugal²University of Porto, Portugal

Background: An intrinsic aortopathy can lead to aortic (Ao) dilatation late after tetralogy of fallot (ToF) repair. Its extension and prevalence is not clearly defined.

Objectives: We aimed to compare the proximal aorta dimensions and elasticity assessed by transthoracic echocardiography in ToF and normal controls, and to find possible predictors of Ao dilatation.

Methods: We included 127 consecutive adults after ToF repair and 63 sex- and age-matched healthy controls. We estimated the Ao z-score at the level of the sinuses of Valsalva (SoV) and ascending aorta (AAo) and defined Ao dilatation for a z-score >2. We assessed Ao strain, distensibility and stiffness index by transthoracic echocardiography using accepted formula.

Results: One hundred-twenty seven patients (pts) (mean age 30±9 years; 52% males) had a mean follow-up time since ToF repair of 23±7 years. In 59 cases, an aortopulmonary shunt was done prior to repair, with a median interval of 3 years. In 57 patients complete repair used a transannular patch. A right Ao arch coexisted in 29 cases. The prevalence of SoV and AAo dilatation were 29.9% and 23.8%, respectively. No differences were found between ToF pts and controls regarding systolic blood pressure and pulse pressure. ToF pts had a bigger Ao z-score (1.4±1.2 vs. -0.6±1.2, P<0.01 and 1.2±1.1 vs. -0.7±0.7, P<0.01, at the level of SoV and AAo, respectively), lower Ao strain [6.9 (2.6-61.5) vs. 15.4 (3.7-45.0), P<0.01] and distensibility [1.4 (0.4-1.4) vs. 3.7 (0.1-1.4) KPa-110-3, P<0.01], and a higher Ao stiffness index [7.4 (0.8-23.6) vs. 3.1 (0.9-14.1); P<0.01]. There was a significant positive correlation between the Ao z-score and left ventricular (LV) mass and volumes indexed to body surface area (AAo z-score and LV mass index in Pearson's correlation (r)=0.26, P<0.01), Ao stiffness index and SAo (r=-0.21; P=0.007). By multivariate analysis, the sinotubular junction effacement was an independent predictor of AAo dilatation [odds ratio 4.1, 95% confidence interval (CI) 1.4-12.3, P=0.01].

Conclusion: It can be concluded that tetralogy of fallot patients have a bigger and stiffer ascending aorta, and transthoracic echocardiography can be used as a screening tool for this aortopathy.

mrcristina.cruz@hsjoao.min-saude.pt

Telemedicine in pediatric cardiac critical care

Ricardo Munoz

University of Pittsburgh, USA

Concurrent changes in demography, world-health trends, and society and information technology/social networks present a significant challenge in anticipated global health care needs in the immediate future. Hence, a new paradigm needs to be developed. Telemedicine can alleviate many of these needs and shows promising way to deliver clinical care and medical education at a distance, in both the intensive care and pediatric cardiology settings, regionally or even across international borders. In pediatric cardiac critical care in particular, telemedicine models of care need to be tailored in accordance to the different characteristics of remote hospitals, and the best ones incorporate a systematic approach during the implementation of quality improvement initiatives. When used in this way, telemedicine can accelerate the process of collective learning, empowering remote teams and allowing for significant improvement in their patient outcomes. Our intuitional experience with telemedicine in pediatric cardiac critical care is presented here with 3310 teleconsultations provided to 6 international hospitals in Latin America in the last 5 years and more than 2000 quality interventions including ECHO telementoring, ECMO-related adjustments, adverse trend detections and surgery-related recommendations. We postulate that telemedicine is an excellent tool helping to improve performance and accelerate the collective learning curve in medical teams treating pediatric patients with critical congenital heart disease.

russkm@upmc.edu