

Functional Outcome in Children and Adolescents with Isolated Left-to-Right Shunt

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INTRODUCTION

Atrial (ASD) and ventricular septal defects (VSD) represent the two most common congenital heart diseases (CHD) and belong to the simple CHDs. Nevertheless, they represent a chronic diseased population and these patients have increased long-term functional impairments and higher cardiac morbidity.

OBJECTIVES

The objective of this study was to investigate several functional outcome measures in children with ASD and VSD in comparison with a healthy control group (CG).

PATIENTS AND METHODS

From May 2014 to October 2018, we examined 148 patients (72 girls, 11.7 ± 3.6 years) with isolated shunts (ASD: 53%, VSD: 47%) for their Health-Related Physical Fitness (HRPF), arterial stiffness, Intima-Media Thickness (IMT) and Health-Related Quality of Life (HRQoL). Native condition was present in 39.7% interventional closure of the defect was performed in 26.5% and surgical closure in 33.7% patients. HRPF was tested by five tasks of the FITNESSGRAM®. The functional arterial stiffness measures, central systolic blood pressure and pulse wave velocity (PWV) were analyzed with an oscillometric device. Structural changes were characterized by IMT of the Arteria carotis communis. HRQoL was assessment of a subjective perspective with the KINDL questionnaire. For comparison, a CG of 2002 children (48.9% girls, 12.8 ± 2.8 years) was recruited within two recent school projects.

RESULTS

After adjustment for age and sex, children with ASD and VSD presented significantly lower HRPF (z-score ASD: -0.49 ± 0.72 $p < .001$; z-score VSD: -0.69 ± 0.072 ; $p < .001$) compared to the CG.

Transferred into percentiles, VSD were on the 25th and ASD on the 31th percentile. Structural and arterial stiffness measures did not differ from CG, nor did HRQoL.

Comparing children with ASD and VSD there were no differences at all in-between these two groups. Regarding the surgical history of the shunts (native, interventional closure, surgical closure), there were also no difference in-between the three states.

CONCLUSION

Children with ASD or VSD have impaired HRPF but fortunately, they have no other functional and structure limitations in terms of arterial stiffness measures and no reduced HRQoL. Early childhood sports promotion would be a good intervention to counteract these restrictions in HRPF at an early stage.