INTRODUCTION AND OBJECTIVES

Adult athlete heart is defined as the changes developed by routine, systematic and sustained sports training. We aimed to describe children’s athlete heart and to analyze these changes in young hearts through echocardiography.

METHODS

331 children (6-18yo, mean 11,92yo, 74% male) under federated sports (football, swimming, tennis, athleticism, basketball) were recruited. They performed at least 3hr training/week during more than 1 year long. Variables were echocardiographic measurements of left ventricle (LV) cavities and LV plus right ventricle outflow tract (RVOT) wall thickness. All measurements were indexed by body surface area and analyzed according to type of sport, training time/week and sport practicing exposure.

RESULTS

118 (33,62%) were football players, 99 (28,21%) swimmers, 58 children (16,52%) were federated in tennis, 40 (11,4%) athletes and 16 (4,56%) basketball players. Maximum training time/week was 7,2h, higher for swimmers and tennis players (>8h/week). LV interventricular septum (IVSd) showed the most relevant changes in cardiac remodeling. Mean thickness was 11,8mm. Statistically significant increased IVSd was described in swimmers and tennis players with a mean value of 14,4mm (p<0,05). For 20,2% of children, IVSd Z-score was >2 (31% of tennis players, 28,3% swimmers). Mean LV posterior wall (LVPWd) thickness was 6mm. 3% of children had LVPWd Z-score >2, specially the elder ones (14,2 vs 11,9 yo). Mean LV diastolic diameter (LVEDd) was 26 mm. 3% had LVEDd Z-score >2, particularly swimmers and basketball players. Mean left atrium diameter (LAD) was 51mm. Z-score >2 was found in 9,8% of children, specifically in basketball group (14,3%), tennis players (12,7%) and swimmers (12,5%). Mean right ventricle short axis diastolic diameter (RVOTd) was 6,3mm, increased up to 9,2mm in swimmers (Z-score>2 in 18,2% vs 14,3%).

CONCLUSIONS

Cardiac remodeling could be present in the paediatric population similar to adult athlete’s heart. IVS thickness showed the most prominent change, specially in tennis players and swimmers, in relationship with hours/week and years of training. Swimming required more training hours and thus a more significant cardiac remodeling. Defining athlete hearts in could be useful to discriminate between healthy athletes and cardiomyopathies. More scientific evidence is still needed to determine athlete pediatric heart.