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Echocardiography differences of heart in swimmers and non athletics

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ABSTRACT

It has been well established that regular physical activity associates with a number of morphological and functional changes of the heart. Some studies failed to find any echocardiograph difference between athletic and non-athletic groups. The aim of this study was to evaluate Echocardiography differences of heart in swimmers and non athletics in swimmers and non athletics. Two groups selected randomly for this study (each 15 person, 21±3.12 years old),. The first group was swimmers and the second group was non-athlete controls. from M-mode and 2-D used for measurment of Diameters of heart. The results of study have shown that there were significantly in swimmers group than the control group, but, There were no significant differences in mean of end systolic diameter and posterior wall thickness of left ventricle in two groups. The stroke volume and volume of left ventricle of heart in anaerobic athlete with enough background dynamic exercise, like swimmers probably increase as well as.

Key words: Echocardiography, heart, swimmers.

INTRODUCTION

Most of the studies of athlete's heart have been performed on Caucasian and yet, evidence suggests that there are racial differences in the response of the heart to certain pathological conditions such as hypertension in hanball players [1]. It has been well established that regular physical activity associates with a number of morphological and functional changes of the heart [2, 3, 4, 5, 6, 7]. However, conflicting results have been reported cincerning the life period when such cardiac adaption becomes demonstrable during biological maturation. Some studies [8,9]. failed to find any echocardiographic difference between athletic and non-athletic groups in prepuberty; while other authors [10, 11, 12, 13, 14, 15]. Reporter done a morphological adaption of the heart at the early age of 10 to 14 years. Forster et al [16]. And Mesko et al. Observed in a longitudinal study of 10- t0 16 year old athletes that the characteristics of the athlete's heart only appeared after two years of systematic exercise training of appropriate intensity, indeed significant differences from the non-athletic groups could only be evidenced after the third ore ven the fourth year of training [17].

Reports on junior athletes are relatively scarce. Sharma et al. could notice differences between the athletic and non0-athletic 14-18 year –old subject in the left ventricular wall thickness, left ventricular internal diameter and left ventricular muscle mass, however there was no difference in the body size related wall thickness [18]. In Young athletes aged 15 to 18 Pavlik et al. [19] and Manolas et al. [20] Showed evidence for the positive effects of regular

physical activity on the development of the athlete's heart. However, we know only few studies about the influence of the different sport events on the cardiac adaption of this age group. Although several authors have approved of a classification of cardiac adaption into categories of concentric- or eccentric type hypertrophy [21, 22, 7], the degree of this hypertrophy in Young athletes is still an open question concering the various physical activites. Covariance analysis showed that also gender and type of sport were significant determinants of LV remodeling; in particular, the highest impact on LV end-diastolic volume and mass was associated with male gender and endurance disciplines ($p < 0.001$). Regardless of the type of sport, athletes had similar LV remodeling indexes to controls (1.00 ± 0.06 vs 1.01 ± 0.07 g/mL, $p = 0.410$). No differences were found between athletes and controls for the ejection fraction ($62 \pm 5\%$ and $62 \pm 5\%$, $p = 0.746$) and systolic dyssynchrony index ($1.06 \pm 0.40\%$ and $1.37 \pm 0.41\%$, $p = 0.058$). In conclusion, 3-dimensional echocardiographic morphologic and functional assessment of the left ventricle in Olympic athletes demonstrated a balanced adaptation of LV volume and mass, with preserved systolic function, regardless of specific disciplines participate [23].. It has been wellestablishedthat regular activity associates with a number of morfological and functional changes of the heart. How ever conflicto results have been reported concerning the life period when such cardica adaption become demostrable during biological maturation. Some studies failed to find any echocardiographic different between athletics and non-athletics group in prebuberty, while other outhors reporte don a morphologicaladaption of the heart at the early ago 10 to 14 years [24]. The aim of this study was comparison of Echocardiography differences of heart in football players and non-athletics in 16- to 18-year old.

MATERIALS AND METHODS

Two groups (N=17 male, 21±3.12 years old) were included, and matched for weight and body surface area. The first group was swimmers and the second group was non-athlete controls. Diameters of heart were measured by M-mode and 2-D echocardiography with a single observer in a blinded fashion.

RESULTS AND DISCUSSION

There were no significant differences in mean of end systolic diameter and posterior wall thickness of left ventricle in two groups, but other variables were significantly larger in middle-distance swimmers than the non athletes group. The results of LSD test showed that mean of left ventricle end diastolic volume and inter ventricle septum thickness were significantly larger in middle-distance swimmers than non athletes (table I).

Table I. Echocardiography differences of heart in swimmers and non athletes

Variable	Means		F	p
	Swimmers	Non athletes		
LVESD mm	27.43±1.32	27.87±2.73	0.682	0.286
LVEDD mm	48.32±1.67	45.64±2.45	5.87	0.001
LVEDV ml	79.45±4.16	60.09±1.03	16.32	0.003
LVESV ml	33.54±2.67	29.34±1.88	4.087	0.002
SV ml	43.23±6.68	32.76±2.43	14.37	0.001
IVST mm	6.43±0.038	6.74±0.02	10.67	0.003
PWT mm	6.45±0.04	5.6±0.076	1.34	0.34

The stroke volume and volume of left ventricle of heart in anaerobic athlete with three years of background dynamic exercise, like swimmers may increases as well as Middle-distance runners. The results of present study are in agreement with many studies. Furthermore dynamic exercise increases the thickness of walls of ventricle. This result is in accordance to Pavlik's study.

CONCLUSION

It was concluded that the studied sports had a different on the development of myocardial adaption to exercise. However, the sequence of age development changes in the morphology and functionality of heart requires further study. Our results confirm results of our previous investigation [15, 23] where we found that endurance type dynamic exercise had led first to an enlargement of the left ventricular cavity and then to the development of muscle mass.

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