Abstract: P4127

CMR normal reference values of biventricular size and function in male athletes

Authors:
F D'ascenzi1, F Anselmi1, P Piu2, C Fiorentini1, M Focardi1, M Bonifazi2, S Mondillo1, 1University of Siena, Department of Medical Biotechnologies, Division of Cardiology - Siena - Italy, 2University of Siena, Department of Medicine, Surgery, and Neuroscience - Siena - Italy,

Topic(s):
Cardiac Magnetic Resonance

Citation:
BACKGROUND. Exercise-induced enlargement of cardiac chambers is commonly observed in competitive athletes. However, ventricular dilatation is also a common phenotypic expression of life-threatening cardiomyopathies. The use of cardiac magnetic resonance (CMR) for the exclusion of pathology is growing. However, normal reference values have not been established for athletes. The aim of this meta-analysis was to derive normal reference values of biventricular size and function estimated by CMR in competitive athletes.

METHODS. We conducted a systematic review of English-language studies in the MEDLINE, Scopus, and Cochrane databases investigating biventricular size and function by CMR in athletes. Athletes were divided into endurance, combined, and mixed groups according to the sport practiced. The potential impact of training volume was also evaluated.

RESULTS Twenty-seven studies and 983 competitive athletes were included for CMR quantification of biventricular size and function. In this review, normal reference values are presented for biventricular size and function to be applied to male competitive athletes according to the disciplines practiced. A significant impact of training volume was demonstrated for the right ventricle: athletes practicing the largest number of training hours per week were those exhibiting the greatest degree of right ventricular remodeling (Figure 1). Notably, biventricular function was not significantly affected by training volume.

CONCLUSIONS. The present meta-analysis defines the normal limits of biventricular size and function estimated by CMR in competitive athletes. The authors suggest using these normal reference values as an alternative to standard upper limits derived from the general population when interpreting CMR images in athletes.
BACKGROUND.Exercise-induced enlargement of cardiac chambers is commonly observed in competitive athletes. However, ventricular dilatation is also a common phenotypic expression of life-threatening cardiomyopathies. The use of cardiac magnetic resonance (CMR) for the exclusion of pathology is growing. However, normal reference values have not been established for athletes. The aim of this meta-analysis was to derive normal reference values of biventricular size and function estimated by CMR in competitive athletes.

METHODS. We conducted a systematic review of English-language studies in the MEDLINE, Scopus, and Cochrane databases investigating biventricular size and function by CMR in athletes. Athletes were divided into endurance, combined, and mixed groups according to the sport practiced. The potential impact of training volume was also evaluated.

RESULTS. Twenty-seven studies and 983 competitive athletes were included for CMR quantification of biventricular size and function. In this review, normal reference values are presented for biventricular size and function to be applied to male competitive athletes according to the disciplines practiced. A significant impact of training volume was demonstrated for the right ventricle: athletes practicing the largest number of training hours per week were those exhibiting the greatest degree of right ventricular remodeling (Figure 1). Notably, biventricular function was not significantly affected by training volume.

CONCLUSIONS. The present meta-analysis defines the normal limits of biventricular size and function estimated by CMR in competitive athletes. The authors suggest using these normal reference values as an alternative to standard upper limits derived from the general population when interpreting CMR images in athletes.