

The Heart of Physically Active Young Individuals can be Remodeled with an Intense 35-Week Military Training

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Physicians are educated and trained to treat diseases and save lives. This is particularly noticeable and valued among cardiologists. However, not every physician, living a busy professional life, manages to see the other “extreme”. We quite often fall ill because we do not properly take care of our health, by failing to adopt a healthy lifestyle and to embrace the most recommended preventive strategies. It seems increasingly important to anticipate the disease and act to prevent it. In such context, the regular practice of physical exercise becomes a significant, if not the major priority. However, there is this natural clinical concern about “excessive” exercise practice, which would jeopardize the health and the physical integrity of the individuals. The study by our Portuguese and Swedish colleagues¹ published in this issue of the International Journal of Cardiovascular Sciences is worth reading.

Dinis et al.¹ have studied 76 young Portuguese individuals who had already achieved high levels of regular physical activity (> 10 hours/weeks) before entering a special military training program. That special training program consisted of 20 hours of different types of exercise practice at a purposely high intensity, divided into five days a week for 35 weeks. Because of the extremely rigorous characteristic of that special program, only 17 of those young individuals, all with previous experience on sports competition, managed to complete the 35-week training.

Keywords

Exercise; Exercise Movement Techniques; Adolescents; High-Intensity Interval Training; Atrial Remodeling/physiology; Arrhythmias, Cardiac/diagnostic imaging.

The training caused several changes in the young participants, such as marked muscle mass gain and significant body fat loss, producing a very healthy body composition profile. As expected, mild reductions in heart rate and blood pressure at rest were observed when comparing the pre- and post-intervention mean values. However, the most relevant finding of that study was the significant left ventricular structural remodeling, identified by use of echocardiographic measurements taken before and after the special military training program, indicating that, even in physically fit young individuals with normal cardiac function, the heart can undergo morphofunctional adaptations of physiological nature, observed at rest.

The question posed by Dinis et al.¹ is certainly relevant and original, and its results contribute to the body of knowledge on exercise and sports cardiology. However, as in any study, some limitations exist, many of which have been reported by the authors. The first is the lack of a control group. However, with such obvious variations in the comparison between the pre- and post-training results, that limitation relates to the scientific methodology theory rather than to the practical and objective significance for the clinician. Nevertheless, it would have been advisable to perform a functional assessment of the aerobic and non-aerobic components of physical fitness,² and, exceptionally, a cardiopulmonary exercise test to quantify the changes in maximum oxygen consumption and anaerobic threshold resulting from the training, widening the range of possibilities of interpreting the functional implications of physical exercise practice on the cardiac remodeling reported by those authors. Another relevant point is that only 22% of the young participants completed the training. If such individuals can or cannot be classified as athletes, as the authors have, can be argued.³ However,

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it would be more important to investigate whether any cardiac morphofunctional aspect obtained on the initial assessment could predict who would be able to complete such a rigorous physical training. Finally, a more detailed assessment of some other cardiac aspects, such as right ventricular function and structure⁴ and the occurrence of arrhythmias (particularly the supraventricular ones), would be interesting.⁵

Briefly, Dinis et al.¹ are to be congratulated on the relevance of the subject studied and the results obtained, from which it is worth noting that more than 700 hours of high-intensity physical training for 35 weeks caused no morphostructural damage to the heart

of healthy young individuals. Such data corroborate the increasingly prevalent impression that, at least from the cardiac viewpoint, it seems unlikely that healthy individuals can reach the true “over-exercise” point that can harm their hearts.⁶ The truly deleterious factor for health is a sedentary lifestyle, and, thus, cardiologists and particularly those interested in exercise and sports cardiology should focus their attention and priority on sedentary individuals or those who exercise insufficiently or incompletely rather than on the extremely rare individuals who, due to a personal option, choose to exercise as much as four hours a day.

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