

Modifications of the non-linear parameters of the heart rate variability related to the systematic practice of physical exercise

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Introduction: In recent years the relationship between the systematic practice of physical exercise, cardiovascular dynamics and the functioning of the autonomic nervous system has been recognized.

Objective: To determine the modifications that nonlinear parameters undergo in the autonomic cardiovascular regulation of the heart rate variability with the systematic practice of physical exercise.

Methodological Design: Retrospective cohort analytical study in the period from February 2016 to August 2018. Universe and sample of 36 individuals (Group 1: 18 high performance baseball athletes, Group 2: 18 students from the University of Medical Sciences of Santiago de Cuba). The data were collected in the Biomedical Basic Sciences Laboratory of the University's Faculty 1, through the 8-channel PowerLab polygraph, and stored using the Kubios Software version 3.0.4 Premium.

Results: Statistically significant differences were found in heart rate values ($p = 0.000$); SD1 ($p = 0.025$); SD2 / SD1 ratio ($p = 0.007$); sample entropy ($p = 0.011$); short-term fluctuations alpha 1 ($p = 0.019$); linear average length ($p = 0.016$); linear maximum length ($p = 0.001$); recurrence rate ($p = 0.034$); determinism ($p = 0.010$) and Shannon

entropy ($p = 0.015$). The parameters of SD1 ($C = 906$) and sample entropy ($C = 712$) were significantly associated with a heart rate ≤ 70 beats / min.

Conclusions: With the systematic practice of physical exercise, the non-linear dynamics of the autonomic cardiovascular regulation of the heart rate variability undergoes modifications that respond to a better adaptability of the autonomic nervous system, and to a greater capacity to regulate cardiovascular function.

Keywords: heart rate variability; physical exercise; athletes