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Heart Rate Variability in Elite American Track-and-Field Athletes

David J. Berkoff and Claude T. Moorman III

Sports Medicine Section, Duke University Medical Center, Durham, North Carolina 27710

David J. Berkoff and Charles B. Cairns

Division of Emergency Medicine, Duke University Medical Center, Durham, North Carolina 27710

David J. Berkoff and Claude T. Moorman III

Michael Krzyzewski Human Performance Laboratory, Duke University Medical Center, Durham, North Carolina 27710

Leon D. Sanchez

Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Boston, Massachusetts 02215

ABSTRACT

Berkoff, D.J., C.B. Cairns, L.D. Sanchez, and C.T. Moorman III. Heart rate variability in elite American track-and-field athletes. *J. Strength Cond. Res.* 21(1):227–231. 2007.—Prolonged training leads to changes in autonomic cardiac balance. This sympathetic and parasympathetic balance can now be studied using heart rate variability (HRV). Studies have shown that endurance athletes have an elevated level of parasympathetic tone in comparison to sedentary people. The effect of resistance training on autonomic tone is less clear. We hypothesized a significant difference in HRV indices in endurance-trained vs. power-trained track-and-field athletes. One hundred forty-five athletes (58 women) were tested prior to the 2004 U.S.A. Olympic Trials. Heart rate variability data were collected using the Omegawave Sport Technology System. Subjects were grouped according to training emphasis and gender. The mean age of the

athletes was 24.8 years in each group. There were significant ($p < 0.01$) differences by sex in selected frequency domain variables (HFnu, LFnu, LH, LHnu) and for PNN50 ($p < 0.04$) for the time domain variables. Two-factor analyses of variance showed differences for only the main effect of sex and not for any other grouping method or interaction. Elite athletes have been shown to have higher parasympathetic tone than recreational athletes and nonathletes. Our data show differences by sex, but not between aerobically and power-based athletes. Whether this is due to an aerobic component of resistance training, an overall prolonged training effect, or some genetic difference remains unclear. Further study is needed to assess the impact of resistance training programs on autonomic tone and cardiovascular fitness. This information will be valuable for the practitioner to use in assessing an athlete's response to a prescribed training regimen.