The Effect of Age and Gender on Heart Rate Variability after Endurance Training

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ABSTRACT


**Purpose:**

This research investigated the age and gender differences in cardiovascular adaptation to a standardized/quantified endurance-training program that included two taper periods.

**Methods:**

The latter was analyzed from spectral analysis of electrocardiogram records of heart rate variability (HRV) at rest in groups of young (19-21 yr) and middle aged (40-45 yr), mixed gender groups (6 males and 6 females), pre- and poststandardized training. All subjects were recreational runners who completed the same 12-wk running program. Before, and subsequent to training, HRV was measured during supine rest and submaximal cycling.

**Results:**

There was a significant decrease in heart rate both at rest ($2.7 \pm 0.45$ beats·min$^{-1}$) and during submaximal exercise ($8.1 \pm 0.67$ beats·min$^{-1}$) in both age groups after training. After training, total spectral power increased ($560.7 \pm$...
308.9 ms$^2$), as well as high-frequency power (362.3 ± 405.5 ms$^2$), in both age groups at rest. The young group showed a greater increase in total power (849.0 ± 308.7 ms$^2$) after the training program.

**Conclusion:**

It is concluded that a well-designed 12-wk endurance-training program will decrease resting and submaximal heart rate in both younger and older adults. The significant increase in HRV, total power, and high-frequency power in all groups after endurance training indicates that HRV measurement appears to provide an effective, noninvasive assessment of cardiovascular adaptation to aerobic training.

**Key Words:** AEROBIC EXERCISE; ADAPTATION; CARDIOVASCULAR CONTROL; BRADYCARDIA