

The Influence of Fatigue and Recovery on Heart Rate Variability, Electrocardiograph, Cardiac Troponin I and B-Type Natriuretic Peptide in Athletes

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Objective: 1) To examine the influence of short term intense training and subsequent recovery on cardiac autonomic control (as measured by heart rate variability), electrocardiograph (ECG), cardiac troponin I (cTnI) and B-type natriuretic peptide (BNP) in athletes. 2) To document the time course of training induced changes. **Design:** prospective longitudinal study. **Setting:** laboratory and water training. **Subjects:** 8 trained male rowers. **Interventions:** 3 days of overload training followed by 3 days of recovery. **Main Outcome Measurements:** performance test (PT), resting haematocrit (hct), heart rate variability (HRV), ECG, cTnI, BNP. **Results:** There were significant decreases in performance and resting hct associated with training. HRV data revealed significant group changes ($p < 0.05$) between lying and standing. There were significant day effects for coefficient of variance (CV), variance, standard deviation (SD), standard error (SE), coefficient of component variance for LF (CCVLF) and 95% confidence interval (95%CI). There were day and posture interactions for mean and median normal-to-normal (NN) intervals. ECGs showed significant changes in R and T wave amplitude. There were no significant changes in cTnI. A significant test and time interaction was found for BNP. **Conclusions:** The time course of recovery of autonomic changes following overreaching training in this study was 48 hours. We recommend that HRV testing occur under standardised conditions at least 48 hours after the last exercise session to monitor athletes for overtraining syndrome. If monitoring recovery from training, we recommend daily standardised HRV.