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Salivary Cortisol Responses and Perceived Exertion during High Intensity and Low Intensity Bouts of Resistance Exercise

Michael R. McGuigan , Alison D. Egan, Carl Foster

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Department of Exercise Sport Science, University of Wisconsin La Crosse, USA

Michael R. McGuigan
 ✉ 221 Mitchell Hall, Department of Exercise and Sport Science, University of Wisconsin-La Crosse, La Crosse, WI, USA
 Email: mcguigan.mich@uwlax.edu

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ABSTRACT

The purpose of this study was to measure the salivary cortisol response to different intensities of resistance exercise. In addition, we wanted to determine the reliability of the session rating of perceived exertion (RPE) scale to monitor resistance exercise intensity. Subjects (8 men, 9 women) completed 2 trials of acute resistance training bouts in a counterbalanced design. The high intensity resistance exercise protocol consisted of six, ten-repetition sets using 75% of one repetition maximum (RM) on a Smith machine squat and bench press exercise (12 sets total). The low intensity resistance exercise protocol consisted of three, ten-repetition sets at 30% of 1RM of the same exercises as the high intensity protocol. Both exercise bouts were performed with 2 minutes of rest between each exercise and sessions were repeated to test reliability of the measures. The order of the exercise bouts was randomized with least 72 hours between each session. Saliva samples were obtained immediately before, immediately after and 30 mins following each resistance exercise bout. RPE measures were obtained using Borg's CR-10 scale following each set. Also, the session RPE for the entire exercise session was obtained 30 minutes following completion of the session. There was a significant 97% increase in the level of salivary cortisol immediately following the high intensity exercise session ($P<0.05$). There was also a significant difference in salivary cortisol of 145% between the low intensity and high intensity exercise session immediately post-exercise ($P<0.05$). The low intensity exercise did not result in any significant changes in cortisol levels. There was also a significant difference between the session RPE values for the different intensity levels (high intensity 7.1 vs. low intensity 1.9) ($P<0.05$). The intraclass correlation coefficient for the session RPE measure was 0.95. It was concluded that the session RPE method is a valid and reliable method of quantifying resistance exercise and that salivary cortisol responds promptly to the exercise load.

Key words: Weight lifting, stress, endocrine effects

Key Points

- The present study showed that salivary cortisol responses were significantly different

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