Effect of an Acute Bout of Resistance Exercise on Math and Attention Skills

Purpose: The purpose of this study was to investigate the effectiveness of resistance exercises on math and attention skills. Methods: Healthy volunteers (22 men and 24 women) with an average age of 23 ± 5 yr were tested on three separate occasions in the McDaniel College Human Performance Lab. On the first day, they gave informed consent and completed a PAR-Q. Each participant’s 15-repetition maximum (RM) was found on four different weight machines (chest press, leg press, leg extension, and seated row). On days two and three, which occurred ≥ 7 days apart, the participant would either sit quietly for 20 minutes (Control) or complete a warm-up and two sets of 15-RM on each of the four exercises (Lifting). The order of testing was counter-balanced. HR was measured on both testing days and RPE was measured on the lifting day. Immediately following the 20 minutes of rest or exercise, a d2 Test of Attention to assess concentration performance (CP), total number of items processed (TN), and total number of items processed minus error score (TN-E) and an arithmetic and algebra (Math) exam were administered. Paired t-tests with Bonferroni corrections and Wilcoxon signed rank tests were used to assess statistical significance (p < 0.05). Results: All data are reported as mean ± SD. On the lifting day RPE averaged 16 ± 2 and participants completed more than 99% of the planned repetitions. The d2 results for the CP (171 ± 34 vs. 161 ± 25), TN (436 ± 78 vs. 412 ± 61), and TN-E (424 ± 77 vs. 401 ± 58) values on the lifting day were all significantly greater (p < 0.017) than the control day. The average math exam score on the lifting day of 68 ± 18% was not significantly different (p > 0.05) than the score of 73 ± 15% on the control day. Conclusion: A single session of resistance exercises improved attention and processing speed. However, the resistance exercises had no impact on mathematical ability. Funded by McDaniel College Student-Faculty Summer Research Fund.