

Responses of Serum Lipids and Lipoproteins Following Power-based Resistance Training in Athletes

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ABSTRACT

Athletes often participate in power-based resistance training to improve their athletic performance by simultaneously enhancing strength and power. However, it is unclear whether athletes participating in power-based resistance training can positively alter serum lipid and lipoprotein profiles. Thus, the current study investigated the effects of power-based resistance training on serum lipid and lipoprotein profiles in athletes. Twenty-one healthy collegiate athletes, 12 female soccer players and 9 male football players, between the ages of 18 and 23, participated in the study during the off-season. The power-based resistance training program consisted of a variety of Olympic-style and traditional weightlifting movements along with plyometrics, and was performed for 4 days a week for 6 weeks, with each workout lasting roughly 60 minutes. One-repetition maximum (1-RM) was tested for clean, incline press, and Olympic-style back squat (angle of knee < 90°), and the following weekly undulating periodization was used: week 1 – 70% 1-RM, week 2 – 80% 1-RM, week 3 – 75% 1-RM, week 4 – 90% 1-RM, week 5 – 80% 1-RM, and week 6 – 95% 1-RM. Overnight fasting blood samples were collected before and after the 6-weeks of training to analyze serum lipid and lipoprotein parameters, including TG, TC, VLDL-C, LDL-C, HDL-C, Lp(a), and ox-LDL. A 2 (groups: males and females) X 2 (time: pre- and post-training) repeated measures ANOVA with pairwise comparisons was employed. A *p*-value of < 0.05 was set for the statistical significance. Serum lipid and lipoprotein parameters remained unchanged, except for ox-LDL, which significantly (*p* = 0.036) decreased by 1.87 U·L⁻¹ or 3.81% (from 49.05 ± 9.17 to 47.18 ± 9.78 U·L⁻¹) following the 6-weeks of power-based resistance training. Thus, 6-weeks of power-based resistance training can significantly lower ox-LDL, and this exercise-induced reduction in ox-LDL may confer a cardioprotective health benefit by decreasing the progression of atherosclerotic events and the pro-inflammatory state within atherosclerotic lesions.