Bone Turnover Markers Responses to Acute Resistance Exercise in Postmenopausal Women

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ABSTRACT

Bone loss increases with aging and elderly women are at the highest risk of osteoporosis and fractures due to menopause. Resistance exercise has been shown the most effective way to strengthen the skeletal system (Kohrt et al. 2004). Bone Turnover Markers (BTM) are enzymes or metabolic byproduct that are released to the blood during bone formation and bone resorption, which reflects the dynamic changes of bone metabolism (Vasikaran et al. 2011). **PURPOSE:** To examine the bone turnover marker responses to an acute bout of resistance exercise in postmenopausal women. **METHODS:** Nineteen female participants aged 50 to 77 years old completed the study. Participants performed a series of resistance exercise (modified Ab Crunches, Hip Abduction, Chest Press, Leg Press, Lat Pulldown, and Leg Extension) at 3 sets of 10 repetitions at 70% of 1-RM. Venipuncture blood samples were taken before (PRE), immediately after (IP) and 60 minutes post exercise (60P). Blood lactate was measured by lactate analyzer. Bone formation marker, Bone Alkaline Phosphatase (BAP), and bone resorption marker, Tartrate-Resistant Acid Phosphatase 5b (TRAP5b), were measured in serum samples in ELISA assays. **RESULTS:** Blood lactate was significant increased immediately after resistance exercise ($p < 0.001$) and remained high 60 minutes post exercise ($p = 0.047$). There were no significant differences in BAP and TRAP5b at baseline, immediately post, and 60 minutes post exercise as shown in Table 1 ($p > 0.05$). **CONCLUSION:** Our results suggest an acute bout of resistance exercise at 70% of 1-RM may not be sufficient to stimulate bone metabolism in postmenopausal women.

BTM	PRE	IP	60P	Comparison*
BAP	0.606 ± 0.172	0.613 ± 0.176	0.613 ± 0.176	NS
TRAP5b	0.562 ± 0.201	0.562 ± 0.188	0.556 ± 0.189	NS