

Public Abstract

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Title:Exploring the Relationship between Changes in Bone Mineral Density, Lean Body Mass, and Hormones in Active, Adult Males with Osteopenia after a 12-Month Exercise Intervention

INTRODUCTION: Weight-bearing exercise may positively affect bone via muscle contractions, impact forces, and hormonal changes; however, the importance of these factors remains controversial.

PURPOSE: To determine if 12-months of resistance training (RT) or plyometric (PLY) exercise beneficially impacts bone mineral density (BMD) in active, osteopenic men, and to examine the potential osteogenic mechanisms. **METHODS:** Participants were randomized to 12-months of supervised RT or PLY. LBM and BMD of the whole body, weight-bearing, and non-weight-bearing sites were measured at baseline and 12-months. Testosterone, free testosterone, and estradiol concentrations were assessed using ELISA kits.

RESULTS: Whole body and leg BMD significantly increased after 12-months with no differences between RT and PLY. Hip BMD increased in the RT group, but remained unchanged in PLY. The percent change in whole body LBM was positively correlated with the percent change in left leg BMD in the PLY group and was negatively correlated with the percent change in left leg BMD in the RT group. The percent change in whole body LBM was positively correlated with the percent change in hip BMD in the PLY group. The percent change in left arm LBM was positively correlated with the percent change in left arm BMD in the RT group. There were no hormonal changes. The percent change in testosterone and estradiol were negatively correlated with the percent change in hip BMD. **DISCUSSION:** In conclusion, the results of the present study suggest that muscle contraction forces and impact forces may be potential mechanisms for osteogenesis in osteopenic men.