Letter To The Editor

Strength training combined with plyometric jumps in adults: sex differences in fat-bone axis adaptations

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TO THE EDITOR: As systematic reviewers of the effects of exercise on bone mineral changes at the spine and hip in adult women, we were interested in the article by Guadalupe-Grau et al. (3) as potentially relevant to our analyses. The authors more than adequately report the hormonal and body composition adaptations in response to a supervised experimental strength and plyometric training program.

In terms of the quality of reporting for inclusion in a systematic review, the authors report explicit inclusion and exclusion criteria for participant selection that may impact on findings and sample size requirements for the main outcome variable are described. Random allocation is reported, but not described. Participant numbers recruited and those lost to follow-up are clearly identifiable through the inclusion of a CONSORT diagram (6), and results are presented for men and women separately.

In terms of treatment effect, their supervised strength and plyometric training has potential to augment bone remodeling. Bone remodeling in adults is related to the interaction between osteoclasts and osteoblasts within basic multicellular units (BMUs) that regulate the augmentation and dissolution of bone (2).

Guadalupe-Grau et al. (3) report their 9-wk intervention as being “long enough to elicit a small, but significant, increase in BMC (bone mineral content).” Furthermore, that the osteogenic response to the program was similar in both women and men, as reflected by “similar enhancements of whole body and lumbar spine BMC” and hormonal concentrations.

We feel some consideration of the “bone remodeling transient” might be appropriate for interpretation of their findings. The bone remodeling transient is a temporary alteration in the balance between bone formation and bone resorption, brought about by any agency that affects bone remodeling (5). Exercise interventions that provide sufficient mechanical loading that alter the remodeling rate can result in short-term changes in the amount of measurable bone mineral without leading to sustained changes in the amount of bone tissue (4). From studies using bone histomorphometry, this “transient” period is thought to be ~10 mo long in premenopausal women and 6 mo in postmenopausal women (4). Indeed, the majority of exercise interventions we previously included in our systematic reviews and meta-analyses have been of 6-mo duration or longer.

The authors do recommend that further strength training studies of longer duration are required to determine if the “increased osteoblastic activity” can translate into increased acquisition of bone mass. We are surprised therefore, that the authors not only measure but emphasize bone mineral outcomes after only a 9-wk intervention, with no reference to the bone remodeling transient as a limitation to the interpretations of their findings. Lack of consideration for the effects of the remodeling transient period in study design may result in incorrect conclusions regarding any intervention that temporarily affects bone mineral outcomes (1).

REFERENCES

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