Introduction

Many studies have found lower bone mineral density (BMD) and bone mineral content (BMC) among adolescent swimmers in comparison with other athletes. Whole-body vibration (WBV) training is a new and promising modality to increase these parameters. Thus, it could be interesting to perform a WBV intervention aiming to improve BMD and BMC in this population.

Therefore, the purpose of the present study was to determine the effects of WBV training on bone mass acquisition in adolescent swimmers.

Methods

Both initial and final assessments included Dual Energy X-ray Absorptiometry measures of the BMC and BMD at the whole body, lumbar spine and non-dominant hip (trochanter, femoral neck and total hip). Analysis of covariance for repeated measures were performed to check differences within groups between pre and post intervention adjusting by age, Tanner stage and height.

Results

WBV training had no effect on bone mass acquisition, as no statistically significant differences were found between VIB and CON at pre- or post-intervention, only a trend for a higher total hip BMC change in VIB than in CON (p=0.07, figure 3). In addition, no group by time interactions and no differences for BMD or BMC change percentage were found between groups. Attendance to the training sessions was registered in the VIB group and it was divided into 3 groups according to the compliance. No differences were found among these compliance groups or between any of them and the CON group (data not shown).

Conclusion

The presented WBV protocol did not confer any benefits to BMD or BMC acquisition in adolescent swimmers. Further analysis of WBV effective dose is needed.

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References


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Do 6 months of whole body vibration training improve bone mass acquisition of adolescent swimmers?

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Abstract

Whole body vibration (WBV) training has been suggested to be an effective type of training for improving bone mass. **PURPOSE:** To determine the effects of WBV training on bone mass acquisition in adolescent swimmers. **METHODS:** Sixty-four swimmers were followed over 8 months. Participants were divided in to two groups: The first group consisted of forty-one swimmers (14.2±1.8 y) who completed a WBV protocol 15 minutes of training 3 days per week during 6 months (WBV training increased each month starting with a peak acceleration of 3.6 g and ending at 11.6 during the last month) while continuing with their habitual water training (VIB). The second group consisted of twenty-three swimmers (15.0±2.2 y) who continued with their regular swimming training (SWI) (both groups performed an average of 10 hours per week of water training). Bone mineral density (BMD) and content (BMC) were measured longitudinally (8 months) by Dual Energy X-ray Absorptiometry at the whole body, lumbar spine and non-dominant hip. Analysis of covariance (ANCOVA) for repeated measures x2 (time) were performed to check differences within groups between pre and post intervention and to determine the effects of the intervention on BMD and BMC values adjusting by change in height and subtotal lean, initial age and final Tanner stage and calcium intake. **RESULTS:** Six months of WBV training had little effect on bone mass, as no differences were found between VIB and SWI for absolute change or percentage change for BMD values. For BMC, VIB presented higher absolute and percentage changes in both trochanter (7% increase in VIB vs. 3% in SWI) and total hip (6% increase in VIB vs. 3% in SWI) than SWI, although there was no group by time interaction. **CONCLUSION:** WBV training might entail minor benefits to BMC acquisition in adolescent swimmers. A minimum compliance of sixty percent was needed to improve BMC, which in the present study consisted of attending at least 2 of the 3 weekly days of training. Future studies using WBV should try to perform more sessions per week at higher intensities to determine if this type of training could be highly beneficial to bone or if other high-impact trainings might be more suitable to improve bone mass in this population.

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