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EFFECT OF WHOLE BODY VIBRATION ON BONE FORMATION AND RESORPTION IN OLDER PATIENTS: A RANDOMISED CONTROLLED TRIAL

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Introduction: Some previous research on animals and humans with poor bone health suggests that whole body vibration (WBV) can improve bone mineral density. It is unclear what effects WBV has on markers of bone formation and resorption. The aim of this analysis from a randomised controlled trial (RCT) on the effects of WBV on musculoskeletal health, was to assess if WBV can affect bone turnover.

Methods: Data were analysed from an RCT on WBV in older participants attending a falls prevention programme. Participants were randomised to Vertical-WBV, Tilting-WBV or Placebo ("sham" vibrating noise) groups. Sessions occurred three days/week for 12 weeks. The sessions were progressive, finishing with six 1 minute bouts per session. Bone formation markers (P1NP) and resorption markers (CTX) were measured at baseline and post-intervention.

Results: 61 participants (37 women) were randomised. Bone marker data were available for a subgroup of 33 subjects (Vertical-WBV n=11, Tilt-WBV n=11, placebo n =11). The mean age of the 33 subjects was 80 years (range 64 to 95 years). The baseline characteristics did not differ significantly between the three groups in terms of age, sex, baseline P1NP and CTX. The percentage change (95%CI) for P1NP in the placebo group was −1.3% (−16.7 to +14.2); Tilt-WBV group +20.2% (−2.8 to +43.1); Vertical-WBV +15.2% (−4.7 to +35.0). There were no significant differences between groups (ANOVA p=0.197). The combined-WBV group (Tilt+Vertical) showed a mean increase in P1NP [+17.5% (+4.0 to +31.1)] compared to the placebo group (p=0.057) [ITT analysis]. Excluding the 2 subjects who were poor compliers, the combined-WBV group had a significantly 20.4% (+0.1 to +40.7) greater increase in P1NP compared to the placebo group (p=0.049). There were no differences or trend towards differences in CTX changes between the groups.

Conclusion: These preliminary data suggest that whole body vibration does not affect bone resorption but may lead to an increase in bone formation. The beneficial effects on bone mineral density shown in some previous studies may be due to an anabolic role of whole body vibration.

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EARLY INTERVENTION TO PREVENT OSTEOPOROTIC FRACTURES

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Introduction: Osteoporotic fractures are a major cause of morbidity and mortality among the elderly population, costing the health service in the UK £1.7 billion per year. Well recognised risk factors for osteoporotic fractures have been established and can be used to identify at-risk patients who would benefit from early intervention. Programmes to prevent fractures should target both falls-related factors and maintenance of bone mass. However, fracture clinics rarely screen for the risk of falls or osteoporosis.

Methods: We have designed a questionnaire for patients with a fracture that have been managed by the A&E department to identify those who would benefit from additional medical input to minimise their risk of future fractures. Patients over 65 years of age attending the fracture clinic were asked to complete this questionnaire with the help of a clinic nurse. The questionnaire enquired about risk factors for osteoporosis and falls, in addition to the type of fracture sustained and circumstances that led to the fall. A geriatrician assessed each patient's responses to identify how many would benefit from either a GP or a medical outpatient review for further management. A letter outlining this management plan was produced for each patient.

Results: 25 completed questionnaires were returned for analysis. There was a strong female bias in the returned questionnaires (24 females, 1 male). 4 patients (16%) had significant osteoporotic risk factors without being on any bone protection and 2 patients (8%) needed further assessment for falls risk. This pilot also highlighted short-falls in the questionnaire's format and these have been modified for future data collection.

Conclusion: A significant proportion of patients attending the fracture clinic have risk factors for osteoporosis and future falls, but are not being optimally managed. This questionnaire will be used to set up an outpatient service which will run in conjunction with the fracture clinic to ensure early identification and intervention for these patients. This should reduce their risk of future fractures requiring hospital admission, thereby benefiting patients' quality of life and reducing future NHS expenditure.