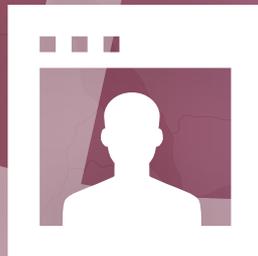


WORLD CONGRESS  
ON OSTEOPOROSIS,  
OSTEOARTHRITIS AND  
MUSCULOSKELETAL  
DISEASES

# VIRTUAL CONGRESS

August 20-22, 2020



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AbstractBook

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### ASSOCIATED RISK FACTORS OF VITAMIN D INADEQUACY IN OSTEOPOROTIC HIP FRACTURE AT POLICE GENERAL HOSPITAL, THAILAND

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**Objective:** To identify the risk factors of vitamin D inadequacy and to investigate the prevalence and mean of vitamin D inadequacy in patients with fragility hip fracture at Police General Hospital, Thailand.

**Methods:** A case-control, single-center study was conducted in 274 patients who were at least 50 y of age, presented with a hip fracture caused by a low energy injury and were admitted to Police General Hospital from April 1, 2014 to April 30, 2018. Patients were divided into 3 groups according to serum 25(OH)D level. Demographic data and factors associated with vitamin D inadequacy were analyzed.

**Results:** Among 258 patients with a hip fracture included for analysis, the majority of them (74.81%) were female. The average age of patients was 78.76 years old. While the mean of vitamin D level was 19.64 ng/ml, the prevalence of vitamin D inadequacy was 86.05%, consisting of vitamin D insufficiency (28.69%) and vitamin D deficiency (57.38%). BMI  $\geq 23$  kg/m<sup>2</sup> and fall  $\geq 2$  times were found to be the associated risk factors for vitamin D inadequacy. Meanwhile, the factors associated with vitamin D deficiency include female gender, BMI  $\geq 23$  kg/m<sup>2</sup>, fall  $\geq 2$  times and serum PTH level  $>65$  pg/ml.

**Conclusion:** Patients with fragility hip fractures had lower vitamin D levels and a higher prevalence of vitamin D inadequacy compared to that of the healthy Thai population. Serum 25(OH)D level examination and vitamin D supplement are recommended in this patient group, especially those with risk factors, i.e., female gender, obesity and high risk for falling.

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### FEASIBILITY, SAFETY AND EFFECTIVENESS OF A 16-WEEK HOMEBASED HOPPING AND JUMPING PILOT EXERCISE INTERVENTION IN POSTMENOPAUSAL WOMEN WITH LOW BONE MINERAL DENSITY

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**Objective:** High impact exercise is recommended to improve bone health, but the feasibility and efficacy of home-based exercise in postmenopausal women with low BMD is unclear. We aimed to determine feasibility, safety and changes in BMD, bone microarchitecture, physical function, and bone turnover markers, following a pilot 16-week home-based high-impact exercise intervention in postmenopausal women with osteopenia or osteoporosis.

**Methods:** 50 community-dwelling postmenopausal women with BMD T-scores  $< -1.0$  participated in 16 weeks of homebased exercise progressively increasing to 50 multidirectional unilateral hops on each leg for 7 days per week. Bone density and structure were assessed by lumbar spine and total hip DXA, 3D modelling algorithms (3D-SHAPER) of hip DXA scans, and distal tibial HR-pQCT scans. Physical performance was assessed by repeated chair stand time and stair climb time.

**Results:** 44 (88%) women (mean $\pm$ SD age 64.5 $\pm$ 7.5 y) completed the intervention, with adherence to exercise sessions of 84.7 $\pm$ 18.0%. Six (12%) women withdrew from the study due to related soreness (n=2), unrelated injury (n=1) and loss of interest (n=3). Femoral neck areal BMD significantly increased by 1.13 $\pm$ 3.76% ( $p=0.049$ ). Trabecular volumetric BMD of the total hip and femoral neck estimated by 3D-SHAPER significantly increased by 2.27 $\pm$ 7.03% ( $p=0.038$ ) and 3.20 $\pm$ 5.39% ( $p<0.001$ ), respectively. Additionally, femoral neck integral (trabecular plus cortical) volumetric BMD increased by 1.81 $\pm$ 4.33% ( $p=0.010$ ). At the distal tibia, total volumetric BMD significantly increased by 0.32 $\pm$ 0.88% ( $p=0.032$ ) and cortical cross-sectional area significantly increased by 0.55 $\pm$ 1.54% ( $p=0.034$ ). Chair stand and stair climb time significantly improved by -2.3 $\pm$ 1.88s ( $p<0.001$ ) and -0.27 $\pm$ 0.49s ( $p<0.001$ ), respectively.

**Conclusion:** A homebased 16-week high impact exercise intervention was feasible and effective in improving femoral neck areal BMD, total hip and distal tibial volumetric BMD, and physical function in postmenopausal women. Homebased high impact exercise interventions may reduce risk factors for fracture in older populations with limited access to clinic- or gym-based programs.

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### THE RELATIONSHIP BETWEEN THE CONCENTRATIONS OF MARKERS OF BONE REMODELING IN PATIENTS WITH RHEUMATOID ARTHRITIS AND OSTEOPOROSIS

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**Objective:** To study the relationship between the concentration of bone remodeling markers in the blood serum of patients with rheumatoid arthritis (RA) and the presence of osteoporosis (OP) according to osteodensitometry.

**Methods:** We examined 88 patients with a reliable diagnosis of RA. Age of the patients ranged from 18-69 y. The diagnosis of RA was made on the basis of the 2010 EULAR diagnostic criteria (2010 American College of Rheumatology/European League Against Rheumatism Rheumatoid arthritis classification criteria). The diagnosis of OP was made on the basis of WHO criteria (for women over 50 in the postmenopausal period) and the Recommendations of the International Society of Clinical Densitometry. All patients underwent DXA. All patients measured levels of markers of bone remodeling: the C-terminal telopeptide of

collagen type I, N-terminal propeptide of procollagen type I, 25-OH vitamin D, calcium blood using commercially available kits. **Results:** After measuring BMD using DXA, all patients were divided into 2 groups depending on the diagnosis of OP: group 1 - patients with RA having OP (n=22) and group 2 - patients with RA not having OP (n=66). The level of the C-terminal telopeptide of type 1 collagen in the blood serum of patients of the 1st group was  $0.85 \pm 0.54$ , in the 2nd group -  $0.62 \pm 0.27$  ng/ml ( $F=6.95$ ,  $p=0.009$ ); the level of P1NP  $88 \pm 4.35$  and  $49.8 \pm 4.29$  ng/ml, respectively ( $F=11.02$ ,  $p=0.001$ ); the level of 25-OH vitamin D  $41.47 \pm 3.7$  and  $52.9 \pm 7.77$  ng/ml ( $F=7.58$ ,  $p=0.007$ ); blood calcium levels of  $2.39 \pm 0.13$  and  $2.45 \pm 0.23$  mmol/l ( $F=0.69$ ,  $p=0.41$ ). **Conclusion:** Patients with RA suffering from OP have a significantly higher level of C-terminal telopeptide of type 1 in blood serum ( $p=0.009$ ), P1NP ( $p=0.001$ ) than in patients without OP. In patients with RA suffering from OP, a significantly lower level of 25-OH vitamin D was detected than in patients without OP. Significant change in blood calcium concentration when comparing the two groups were observed.

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### SOCIOECONOMIC DEPRIVATION INCREASES SECONDARY CARE HEALTH COSTS IN THE YEAR FOLLOWING HIP FRACTURE IN ENGLAND

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**Objective:** Deprivation predicts poorer health outcomes. We quantified differences in hospital costs post hip fracture (HF) between those living in higher and lower deprivation areas of England and investigated potential mediators of such differences.

**Methods:** We used English Hospital Episodes Statistics linked to the National HF Database (04/2011-03/2015) and national mortality data to identify patients admitted with HF aged 60+ years. Hospital care was costed using 2017/18 national reference costs, by Index of Multiple Deprivation quintile. Three generalised linear model regressions estimated associations between deprivation and costs, and the pre- and post-fracture variables that mediate this relationship.

**Results:** We identified 213,607 hospital admissions with an index HF; mean (SD) age 83 (8.4) y, 73% female. The total mean inpatient care cost in the year post HF was £12,949 per patient (95%CI £12,931, £12,984). Of this £9445 (£9424, £9465) was incurred during the index admission and £3504 (£3471, £3530) through readmission costs. Patients from the most deprived areas had higher hospital costs in the year post-HF (£1120 [£993, £1247]) than those from the least deprived areas. The National Health Service (NHS) would save £28.8 million annually in hospital costs alone if all patients had the same costs as those in least deprived areas. Pre-HF characteristics, particularly comorbidities and anaesthetic risk grade, accounted for ~50% of the association

between deprivation and costs. Post-HF factors, e.g., early mortality/transitions in care, did not explain the association between deprivation and costs.

**Conclusion:** Socioeconomic inequalities are associated with substantial NHS costs after HF. Much of the association between deprivation and health cost is explained by poorer preexisting health in patients living in deprived areas. Findings have implications for public health provision addressing lifestyle factors, physical activity patterns and social isolation. Research addressing in-hospital decision making as applied to individuals with varying deprivation backgrounds is warranted.

**Funding:** Royal Osteoporosis Society (formerly the National Osteoporosis Society)

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### "STRUCTURAL RESONANCE" ELECTROMAGNETIC THERAPY IN PATIENTS SUFFERING FROM RHEUMATOID ARTHRITIS

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**Objective:** To study the comparative effectiveness of structural resonance electromagnetic (SREM) therapy and conventional methods for treating patients with RA. SREM therapy is the technique based on exposure to an organism with an alternating electromagnetic field, the parameters of which correspond to the frequencies of spontaneous biopotential activity of organs and tissues of a healthy organism.

**Methods:** We observed 70 patients with RA including 52 women (74.3%), and 18 men (25.7%). The average age of patients was 42.5 y and average duration of the disease was 7 y. Patients were divided into two groups, comparable in clinical characteristics of the disease. 40 patients of main group received 10-15 daily sessions of SREM therapy on the REMATERP™ device on the background of pharmacotherapy. The control group of 30 people received similar medication. The analysis of the effectiveness of therapy was carried out by studying the dynamics of required clinical and laboratory indicators of treatment effectiveness and their comparison in patients of the main and control groups before and after treatment.

**Results:** The treatment results were significantly better in the main group of patients with RA ( $\chi^2=7.57$ ;  $p<0.01$ ), where there was a significant positive trend: a decrease in the inflammatory index, articular count, morning stiffness, a decrease in ESR, C-reactive protein, and seromucoid. Therefore, in the group of patients who received structural resonance therapy, not only analgesic, but also a more pronounced anti-inflammatory effect was observed ( $\chi^2=4.44$ ;  $p=0.05$ ). It can be assumed that low-frequency electromagnetic fields influence on activation of regulation of local blood flow, increase of tissue resorption capacity, which leads to a weakening of muscle tonus, an increase in the excretory function of the skin and a decrease in edema in the focus of inflammation. In addition, the compression of painful conductors is reduced due to electroosmosis.