T418

Testing of Mechanical Properties of Hip Protectors Using High Tech Materials. G. Holzer, L. A. Holzer*. Department of Orthopaedics, Medical University of Vienna, Vienna, Austria.

Purpose: To test the mechanical properties of hip protectors using high tech materials compared to conventional hip protectors according to a European Standard.
Methods: Two hip protectors using new high tech materials and five conventional hip protectors (AHIP protector, Astrosorb; AHF Hip pant, Hips, KPH, Safehip, Safety Pants) were mechanically tested using an mechanical testing maschine (impact testing with 50 Joule) according to a European Standard (EN 1621-1). Results are peak (max) expressed in kiloNewton.
Results: The results of impact testing of two hip protectors using high tech materials were superior (AHIP protector 9.10 kN, Astrosorb 12.65 kN) to conventional hip protectors (21.97 - 50.62 kN), which differ in performance to mechanical testing.Conclusions: The results of this study show that new high tech materials with improved mechanical properties are superior to currently available hip protectors from the mechanical point of view. Utilizing these materials allow designing new hip protectors with increased compliance and adherence. AHIP protector, a hip protector using high tech material, implements modern design, improved wearing comfort and best mechanical properties.

Disclosures: G. Holzer, None.

T419

Vertebral Compression Fractures in Patients with Poor Bone Quality: When and Which Osteoplasty? The Need for a Global Approach. R Iundusi*[1], G. Cannata*[2], D. Lecce*[2], I. Ceroçchi*[2], M. Celi*[2], U. Tarantino[2]. [1]Orthopaedics and Traumatology, University of Rome "Tor Vergata", Rome, Italy, [2]Orthopaedics and Traumatology, University of Rome, Rome, Italy.

INTRODUCTION: Osteoporosis (OP) is estimated to afflict 200 million women worldwide. About 1.7 million vertebral compression fractures (VCFs) occur every year in Europe and in the US. Vertebral fractures are the most common type of fragility fractures due to alterations in bone quality, quantity and microarchitecture. Usually they occur with low energy trauma and result in pain about the fracture site, loss of vertebral body height, and kyphotic deformity. Only few patients gain benefits using conservative treatments. The aim of our study is to establish when there are the conditions to perform a vertebral osteoplasty and which technique, based on personal experiences and on omogeneous datas from the international literature, is suitable for each patient.
MATERIALS AND METHODS: Vertebroplasty and balloon kyphoplasty are two minimally invasive surgery approaches developed for the management of symptomatic VCFs. Vesselplasty is a new minimally invasive surgical technique which provide pain relief, stabilization of the vertebral body, and it has the ability to provide some correction of deformity with partial restoration of vertebral body height. During vesselplasty procedure an artificial "vessel" system, the Vessel-X®, is introduced into the vertebral body to achieve augmentation after which low-viscosity bone cement mixed with calcium phosphate is injected into the vertebral body: the Vessel-X® are expanded to their predetermined configuration and a few bone void filler material penetrates through the "vessels" interdigitating the vertebral body, reducing one of the most common adverse effects of other minimally invasive techniques such as cement leakage.
DISCUSSION: Treatment of OP has made enormous advances in the past years, resulting in a wide range of options. We remind the importance of a global approach to the osteoporotic patients: the best treatment remains early diagnosis evaluating bone remodelling markers, lumbar and femoral Dual-energy X-ray absorptiometry (DEXA), thoracic and lumbar x-rays imaging and risks fracture assessment to ensure an individual and best appropriated therapy as specific as possible. Vesselplasty is a safe and effective minimally invasive procedure for relief of pain associated with VCFs, and improves mobility decreasing the potential risks associated with immobility. Future trials evidence should investigate if the association of vertebral osteoplasties with specific drugs acting on bone quality and rehabilitation could improve clinical outcomes reducing comorbidities and restoring a good and reasonable quality of life.

Disclosures: R. Iundusi, None.

T420

Organic Nitrate Use, Bone Loss and Fractures in Older Men. S. A. Jamal[1], D. C. Bauer[2], J. A. Cauley[3], S. R. Cummings[2]. [1]Medicine, University of Toronto, Toronto, ON, Canada, [2]San Francisco Coordinating Center, CPMC Research Institute and University of California, San Francisco, CA, USA, [3]Epidemiology, University of Pittsburgh, Pittsburgh, PA, USA.

Observational studies report positive associations between organic nitrate use, increased BMD, and decreased fractures among postmenopausal women. To determine the association between self-reported nitrate use, bone loss and fracture incidence in men we used data from the Osteoporotic Fractures in Men (MrOS) study, a large cohort of older men.
Men who reported use of nitroglycerin, isosorbide mononitrate or isosorbide dinitrate (either on an "as needed" or regular basis) in the 2 weeks preceding the baseline visit were classified as nitrate users. BMD at the hip and lumbar spine was measured with a Hologic QDR4500 at study entry and about 4.5 years later. Low trauma non-spine fractures were centrally adjudicated, and 331 men suffered one or more fracture during a mean follow-up of 5.4 years.
We used multiply adjusted linear regression models to determine the association between nitrate use and % change in BMD, and Cox proportional hazards models to determine the association between nitrate use and fracture. There were 248 nitrate users and 5455 nonusers at the baseline visit. Nitrate users were significantly older than nonusers (76.5 yrs vs. 73.6) but there was no significant difference in body weight (82.7 kg vs. 83.1). Compared with nonusers, users were more likely to have had a fall in the past year, had poorer self-rated health, reported greater impairment of activities of daily living, were less physically active and had weaker grip strength. More nitrate users than nonusers reported use of statins and thiazides. After adjusting for these differences, and clinic site, there was no difference in the change in BMD over 4.5 years of follow up at the total hip among nitrate users -1.9% (95% Confidence Interval [CI] CI: -2.6 to -1.3) compared to nonusers -1.8% (95% :-1.9 to -1.7). There was no difference in the % change in spine BMD among users 5.1% (95% CI: 3.1 to 7.2) compared to nonusers 4.6% (95% CI: 4.2 to 4.9). There was no difference in the incidence of fractures among nitrate users compared to nonusers (Relative Hazard: 0.9; 95% CI: 0.5 to 1.5).
Contrary to previous studies in older women, we found that use of nitrates was not associated with increased BMD or decreased in fracture risk among men participating in the Mr.OS study. The lack of association may be due to limitations of observational data, differences in dose or frequency of nitrate administration, or biological differences in organic nitrate effects by gender. Further research is required to definitively determine the effects of nitrates on bone in men.

Disclosures: S.A. Jamal, None.

T421

TENS (Transcutaneous Electrical Nerve Stimulation) in the Management of Osteoporosis-related Pain. S. Kalra*[1], A. Sharma*[1], B. Kalra*[2], N. Kumar*[3]. [1]Endocrinology, Bharti Hospital, Karnal, India, [2]Gynaecology, Bharti Hospital, Karnal, India, [3]Physiotherapy, Bharti Hospital, Karnal, India.

Pain is a disabling symptom in persons with osteoporosis, and it often reduces the quality of life. This paper studies the effect of TENS in subjects with osteoporosis, complaining of pain.
30 adult osteoporosis patients with lower limb pain, receiving five sittings of TENS on daily or alternate day basis, were compared with 30 age-matched, disease-matched patients who were administered daily diclofenac and five sittings with sham electrodes.
Pain scores, measured by visual analog score, reduced significantly in both groups, but much more so in the TENS group (from 4.60 ± 0.54 to 1.60 ± 0.54) than the sham electrodes + diclofenac group (from 4.40 ± 0.54 to 3.60 ± 0.54). This difference was maintained after 3 weeks, even though the TENS sittings had stopped. Best improvement was obtained in patients with burning (3.28 ± 0.64) and lancinating (3.12 ± 0.64) pain. Least benefit was in patients with deep pain (2.15 ± 0.35) and restless legs syndrome (2.16 ± 0.56).
The dose of TENS used varied from 5.5 to 9.0 Hz on the initial day to 3.5 to 5.5 Hz on the last sitting. The dose varied insignificantly for different symptoms.
Validated health-related questionnaires were used to assess the effect of physiotherapy sessions in the subjects. Physician communication score improved from 1.43 ± 1.19 to 3.93 ± 0.86 over one month of therapy in all subjects. Time spent by them in stretching/ strengthening exercise increased from 0.0 ± 0.0 to 15.0 ± 0.0 minutes per week. The social/ role activities limitation due to the disease reduced from 2.25 ± 0.63 to 1.08 ± 0.39. Cognitive symptom management improved from 1.30 ± 0.63 to 2.00 ± 0.67.
The health distress score fell from 3.20 ± 0.82 to 1.35 ± 0.47 while energy/fatigue scores raised from 2.25 ± 0.51 to 3.30 ± 0.50 in all subjects. No difference was noted in these scores between the two groups.
This paper demonstrates the beneficial effect of TENS on pain related to osteoporosis, and the advantageous effects of regular physiotherapy on various health-related parameters in persons with osteoporosis.

Disclosures: S. Kalra, None.

T422

Withdrawn