Conclusion: There was statistical significant difference among groups 1 i 2, 2 i 3, 2 i 4 after 12 months; among groups 1 i 3, 2 i 3, 3 i 4 after 24 months. Different antiresorptive potential of different drugs and dosing regimes was proved by this results, clearly.

P222. Is the polymorphism of the Sp1 spot collagen type I COL1A1 gene A marker of a risk of low-energy fracture?

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Introduction: The type I collagen is a main structural protein of bone matrix. It contributes over 90% of its proteins. A triple helix structure of a collagen is stabilized by hydrogen bonds. Gene of collagen type 1 alpha (COL1A1) is one of the strongest candidates to have an influence on the development of osteoporosis. Environmental factors and interactions between genes have a significant modifying influence on phenotypic expression of this disease.

Objectives: The aim of study was to analyze correlation between genetic polymorphism COL1A1 gene with bone mineral density and risk of osteoporotic bone fractures within postmenopausal women.

Materials and methods: The study was done in a group of 247 postmenopausal women from the region of Greatpoland (Poland) aged 45–85 years (mean 65.5 years). For all patients BMD were measured by dual energy X-ray absorptiometry (DEXA) apparatus (Lunar) in femoral neck and lumbar spine L1–4. There were, according to WHO criteria, 113 patients with osteoporosis, aged 51–85 years (mean 70.3 years), 110 with osteopenia aged 47–81 years (mean 63.5 years). The control group consisted of 24 women, aged 45–77 years (mean 62.1 years). Polymorphisms of Sp1 spot COL1A1 gene were done by PCR and RFLP-restriction fragment length polymorphism method analysis with DNA isolated from peripheral blood lymphocytes.

Statistical methods: the χ-square test was used to evaluate the distribution of genotypes. The significance level was set at $p<0.05$.

Results: Distribution of alleles COL1A1 SS/Ss/ss agreed with Hardy–Weinberg equilibrium. Polymorphism SS occurred in 161 subjects, Ss in 77 and ss in nine patients. There were no statistic differences between values of BMD in the subgroups within polymorphic variants. In opposite to it a high tendency to association between allele s COL1A1 gene and low-energy fractures ($p=0.012$).

Conclusions: 1. In Polish postmenopausal women a high tendency in association allele s COL1A1 gene to osteoporotic bone fracture has been proved. 2. The analysis of Sp1 spot COL1A1 gene may be useful in diagnosis of vulnerability to osteoporotic fractures within postmenopausal women population.

P223. Secondary fracture prevention measures in orthopedic wards in Belgium

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Objectives: In-hospital diagnosis of osteoporosis in fracture patients in the orthopedic wards is lower than 10% and the prescription rate of treatments is less than 5%. The present report describes the efficiency of a secondary prevention program in Fracture patients in Orthopedic Wards (FORWARD) in a Belgian hospital care setting.

Materials and methods: Orthopedic surgeons willing to participate in the program were requested to refer their patients with clinical fractures for bone densitometry and an osteoporosis specialist's advice.

Results: In 36 hospitals data were collected about 4,116 fracture patients. Females represented 73.5% of the population. Fracture prevalence increased until the age of 80–85 years, with mean age of 78 year in women and 74 year in men. Most of the fracture cases were hospitalized (88%) and the main fracture type included in the program was hip fracture (45%). Previous clinical fractures were reported in 21% of the patients. Nine percent had previous DXA examination or concomitant osteoporosis treatments and were therefore excluded for DXA referral. Appointments for DXA examination were made in 66% (n=2,718) of the patients and results were obtained from 53% (n=2,181). The diagnostic classification was as follows: osteoporosis 56%, osteopenia 33% and normal bone density 11%. Nearly all cases were referred for diagnostic confirmation of the problem by an osteoporosis specialist, mainly rheumatologists and physiotherapists. Final clinical diagnosis of osteoporosis was accepted in 39% of the cases. Treatment with calcium and vitamin D was started in 1,303 patients (31%), with bisphosphonates in 888 patients (21%)

and with SERMs or others drugs in 108 patients (<3%). No data about compliance to these treatments were obtained in the present project.

Conclusion: The active referral by orthopedic surgeons of the fracture patients in the orthopedic ward to DXA units and osteoporosis specialists results in the identification of osteoporosis in 39% of the patients. Implementing effective measures and treatments for (secondary) fracture prevention in this high risk population could lead to cost-savings in the short term. Initiatives to promote the patient flow needs to be elaborated and maintained by an active local care organisation.

P224. A novel approach to the assessment of bone quality: ultrasonic imaging of bone porosity

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Currently, there are numerous methods used to detect and determine the level of bone loss in many areas of the body, including the hip, spine, and heel; however, most of these methods require ionizing radiation, which may be harmful to the body. Some of these methods include single energy x-ray absorptiometry (SXA), dual energy x-ray absorptiometry (DXA), broadband ultrasonic attenuation (BUA), and quantitative computer tomography (QCT).

The objective of this project is to introduce a less complicated and safer bone diagnostic tool using high frequency ultrasound (HiFU) to image and assess bone quality and to determine bone mass in the human ilium. Although the ilium is not the ideal medium for such evaluation, it has been chosen as a proof-of-concept object and for its anatomical shape and flatness. Ten human skeletal ilium samples were used in this study. All of the specimens were assumed to be female while age and race were unknown. For comparison and correlation, final results from the ultrasonic method are compared with bone scans using the DXA modality due to the latter's prominence in today's evaluation of human subjects. Several tests were performed on each of the samples in order to obtain a complete quantitative as well as qualitative outcome. Our late-breaking results show an overall average percent error of 3.5% when compared to DXA. The data correlates extremely well to the family of bone measurements as provided by DXA (correlation coefficient r=0.903). For instance, ultrasonic percent bone loss increases with decreased bone mass, decreased density, and increased porosity. This is reflected in the excellent correlation between the two methods. Data extrapolation of DXA PBL versus DXA BMD (r=0.870) parallels those obtained with ultrasonic PBL versus physical dry mass density (r=0.674). When the dry mass density is plotted against BMD data obtained with DXA, an excellent positive match is observed as well (r=0.792).

P225. Effects of alfacalcidol on bone markers and bone mineral density in alendronate-treated postmenopausal women with osteopenia or osteoporosis: one year interim analysis of the ALFA study

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The purpose of the ALFA study (three-year prospective, randomized, double-blind, placebo-controlled trial) is to evaluate the effect of alfacalcidol 1 μg daily on the number of falls in postmenopausal, alendronate-treated, osteopenic or osteoporotic women. A pre-planned one year interim analysis was performed to examine the effect of alfacalcidol on bone turnover markers ad bone mineral density for safety reasons.

A total of 278 postmenopausal women (mean age 73.7 years, SD 4.8) received either alfacalcidol 1 μg or placebo daily, in addition to alendronate 70 mg weekly and calcium 500 mg daily. Lumbar spine and hip BMD were measured by DXA at baseline and after 12 months of treatment. Biochemical markers reflecting calcium metabolism and bone turnover [serum calcium, 25-OH-vitamin D, calcitriol, intact parathyroid hormone (iPTH), bone-specific alkaline phosphatase (BAP) and serum N-telopeptide (sNTX)] were measured at the beginning of the study, before treatment and after 3, 6 and 12 months of treatment.

Baseline characteristics of patients, including age, body mass index, biochemical markers of bone metabolism, lumbar spine BMD (mean T-Score −2.33 SD vs. −2.40 SD), and hip BMD (mean T-Score −1.40 vs. −1.45) were not significantly different between the two groups.

The decrease of bone turnover markers was more pronounced in alendronate-treated patients who additionally received alfacalcidol. It was significant for BAP and missed just shortly the significance level of 0.05 for sNTX.