the ability of software BHC to remove density artefacts. Meaningful microCT bone densitometry is possible provided that scans are made with suitable filter, appropriate BH correction is applied, x-ray absorption outside the camera field of view (truncation) is minimal, and that as far as possible sample (and calibration phantom) dimensions and mounting are standardised. Densitometry is more accurate in the absence of surrounding media such as water or tissue.

IBDW2014-00071-F003
A MULTICENTER, RANDOMIZED, DOUBLE-BLIND, AND PLACEBO-CONTROLLED STUDY OF CHINESE ZUOGUI PILL AND YOUGUI PILL FOR IMPROVING BONE MINERAL DENSITY
De-Zhi Tang a, Chen-Guang Li b, Xue-Jun Cui a, Feng Yang b, Dong-Feng Zhao a, Zhu Yang b, Xiang Gao a, Xing-Lun Liang a, Yu-Hong Zeng c, Xiao-Feng Li a, Qin Biana, Bing Shua, Jing Wanga, Dong-Feng Zhao a, Zhu Yanga, Xiang Gaoc, Xing-Lun Liangd, and De-Zhi Tang

The Central Hospital of Yangpu district, Shanghai, Shanghai, 200090, PR China
bShanghai University of Traditional Chinese Medicine, Xinyang, 712000, PR China
cHuadong hospital affiliated to Fudan University, Shanghai, 200040, PR China
PR The Central Hospital of Yangpu district, Shanghai, Shanghai, 200090, PR China
dThe Red Cross Hospital of Xi’an, Shanxi, 710002, PR China

Background: Natural herbal therapy offers an attractive alternative for osteoporosis. The objective of this study is to evaluate the efficacy and safety of natural Chinese herbs, Zuogui Pill (ZGP) and Yougui Pill (YGP), for low bone mineral density (BMD).

Methods: 200 subjects were included double-blindly and randomly allocated into two groups, treatment and control. All subjects were diagnosed with low BMD and kidney deficiency in Traditional Chinese Medicine (TCM). Subjects in treatment group were treated for 6 months with either ZGP or YGP based on clinical characters of TCM, while control group received placebo for the same period of time. Primary outcome was lumbar BMD as determined by using dual-energy X-ray absorptiometry. Secondary outcomes included visual analogue scale (VAS), quality of life (ECOS-16), and serum markers of bone metabolism. Adverse effects were documented for safety assessment. Follow-ups were performed at regular intervals during a one-year period.

Results: In ZGP group, lumbar BMD was increased by 4.1% immediately after the treatment (P<0.05) and by 4.7% at the end of the additional 6-month follow-up. Bone anabolic marker was also significantly improved after treatment (P<0.05). In YGP group, the VAS and ECOS-16 scores were also significantly reduced after treatment (P<0.05). Furthermore, bone resorption marker was significantly suppressed after treatment in YGP group (P<0.05), and bone anabolic marker was significantly increased (P<0.05), respectively. No severe adverse effects were observed.

Conclusion: ZGP and YGP are effective and safe therapeutic drugs for osteoporosis, which improve lumbar BMD, reduce pain intensity, alleviate bone resorption, and stimulate bone formation.

Acknowledgements
This work was supported in part by the National Basic Research Program of China (973 Program, 2010CB530400), the Development Program of Innovation Team of Ministry of Education (1RT1270), the Program of National Science Foundation of China (81102604), Outstanding Young Training Plan in Shanghai Health System (XYQ2013085), Scientific Research Innovation Project of Shanghai Education Committee (14YZ051).

IBDW2014-00072-F004
BONE MINERAL DENSITY IN POSTMENOPAUSAL WOMEN WITH ESSENTIAL HYPERTENSION
V. V. Povoroznyuk a, N. B. Nekrasova a, O. I. Nishkumab, O. I. Nishkumayb
aDepartment of Clinical Physiology and Pathology of Locomotor Apparatus, Institute of Gerontology AMS Ukraine, Ukrainian Scientific-Medical Centre for the Problems of Osteoporosis, Kyiv, Ukraine
bLugans State Medical University, Lugans, Ukraine

Background: Menopause is the special period in women’s life when many physiological changes develop simultaneously, for example, hypertension, decrease BMD, osteoarthritis, but, unknown how the quality of bone can changes.

Methods: In Department of Clinical Physiology and Pathology of Locomotor Apparatus, Institute of Gerontology AMS Ukraine 115 women aged 46-78 (average age is 66±6.4) were subdivided into three groups: group I comprised 42 patients diagnosed with osteoarthritis (gonarthritis) roentgen phase II (Kellgren & Lawrence, classification)), group II comprised 24 patients with hypertension second degree, group III (13 women) with stage II osteoarthritis combined with hypertension of the second degree. Bone mineral density (BMD) was determined by means of Dual-energy X-ray absorptiometer “Prodigy” (GE Medical systems).

Results: BMD was decreased group III patients compared with women in I and II groups (9.7±0.05, 1.1±0.03 and 1.14±0.09 respectively p<0.05). This indicates an violation bone quality due to influence of hypertension on bone metabolism. The results point to necessity prescribe early treatment to improve bone quality in group III women aged 60-80 years.

IBDW2014-00073-F005
BONE MINERAL DENSITY OF THE LOWER EXTREMITIES IN DIABETIC POLYNEUROPATHY
V. V. Povoroznyuk a, V. A. Pennerb, O. I. Nishkumayb
aDepartment of Clinical Physiology and Pathology of Locomotor Apparatus, Institute of Gerontology AMS Ukraine, Ukrainian Scientific-Medical Centre for the Problems of Osteoporosis, Kyiv, Ukraine
bLugans State Medical University, Lugans, Ukraine

Background: Diabetes affects over 170 million people globally. Peripheral diabetic polyneuropathy is one of the more debilitating complications arising from hyperglycaemia, affecting 30-70 % of all diabetics and making it the most prevalent painful neuropathy. Although diabetic neuropathy occurs often and has characteristic clinical manifestations, it is typically poorly diagnosed, especially in the early stages of the disease. Cellular and molecular mechanisms of interaction of peripheral nervous system with a bone metabolism till now poorly studied. Different screening methods have reproduceed different results.

Aim: The aim of this study to assess the bone mineral density (BMD) of the lower extremities in women in the postmenopausal period with diabetes mellitus (DM) type 2 and its dependence from diabetic peripheral polyneuropathy.

Method: This research have taken 51 women, average age 54.7 ± 2.49 year with DM type 2, of whom 29 were diagnosed with distal polyneuropathy of the lower extremities. The control group consisted of 25 women, average age 52.2 ± 2.15 year with no risk factors for reduction in BMD. Clinical evaluation comprised clinical and neurologic status, questionnaire related to osteoporosis (the Kanis, 2010), DN4, a visual analogue scale (VAS), scale NISLL. BMD was determined by dual-energy x-ray absorptiometry (DXA) (“Prodigy”, GE Medical systems).

Results: BMD (0.63±0.02) was significantly lower in patients with type 2 diabetes, complicated by distal polyneuropathy of the lower extremities, compared with either patients without polyneuropathy (0.83 ±0.05 (p=0.021)) or with healthy women (1.03 ±0.2 (p=0.045)). This data confirms the impact of diabetic polyneuropathy on bone metabolism. Future research will focus on these findings and comprise correlation with intensity of pain syndromes to determine the value of a personalized treatment approach.

IBDW2014-00074-F006
TRABECULAR BONE SCORE AND LOSS OF TEETH IN POSTMENOPAUSAL WOMEN WITH PARODONTITIS
V. V. Povoroznyuk a, A. M. Pilavb
aDepartment of Clinical Physiology and Pathology of Locomotor Apparatus, Institute of Gerontology NAMS Ukraine, Ukrainian Scientific-Medical Centre for the Problems of Osteoporosis, Kyiv, Ukraine
bLugans State Medical University, Lugans, Ukraine

Background: Menopause is the special period in women’s life when many physiological changes develop simultaneously, for example, hypertension, decrease BMD, osteoarthritis, but, unknown how the quality of bone can changes.

Methods: In Department of Clinical Physiology and Pathology of Locomotor Apparatus, Institute of Gerontology AMS Ukraine 115 women aged 46-78 (average age is 66±6.4) were subdivided into three groups: group I comprised 42 patients diagnosed with osteoarthritis (gonarthritis) roentgen phase II according to classification of Kellgren & Lawrence (1957), group II comprised 24 patients with hypertension second degree, group III (13 women) with gonarthritis of stage II in combination with hypertension of
the second degree. Bone mineral density (BMD) was determined by means of Dual-energy X-ray absorptiometry “Prodigy” (GE Medical Systems). Index quality of bone (Trabecular Bone Score, TBS) was determined by programs Med-Imaps iNsight, France.

Results: The results showed decrease TBS in group III aged 40-59 years compared with women in only osteoarthritis (1,18 ± 0.01 and 1,31 ± 0.02 respectively p<0.05). This indicates an earlier violation bone quality in comorbid pathology, possibly due to influence of hypertension on bone metabolism. In group III aged 60-80 TBS was decreased and did not depend on the disease. It shows the influence of the duration of menopause on bone quality.

Conclusion: The results point to necessity prescribe early treatment of violation bone metabolism in women in age group 40-59 years.

IBDW2014-00075-F007
ANTHRROPOMETRIC CHARACTERISTICS OF POSTMENOPAUSAL WOMEN DEPENDING ON APPENDICULAR SKELETAL MASS
V. Povoroznyuk, N. Dzerovych, R. Povoroznyuk
D.F. Chebotarev Institute of gerontology NAMS Ukraine, Kyiv, Ukraine

Objective: The aim of our study was to evaluate the anthropometric characteristics of the postmenopausal women depending on their appendicular skeletal mass.

Materials and methods: We’ve examined 8882 women aged 20-89 years (mean age = 65.76 ± 14.14 yrs; mean height = 165.7±0.07 cm; mean weight = 73.5±0.16 kg), taken anthropometric measures of 79 examined postmenopausal women aged 40-82 yrs (mean age = 63.53±1.08 yrs, mean height = 157.54±0.79 cm, mean weight = 74.75±1.68 kg). Appendicular skeletal mass (ASM) was measured at the four limbs with DXA. We’ve also calculated the appendicular skeletal mass index (ASMI) according to the formula: ASM/height (kg/m2). During the quartile analysis, depending on their ASMI parameters, the examined women were divided into the following groups: Q1 – ASMI < 6.38 kg/m2 (n = 20), Q2 – ASMI = 6.38-8.63 kg/m2 (n=20), Q3 – ASMI = 6.84-7.36 kg/m2 (n=20), Q4 – ASMI > 7.36 kg/m2 (n =19). Anthropometric characteristics of the women were evaluated according to the V.V.Bunak’s method (1941) modified by P.F. Sha- parenko (1994). Lean and fat masses were measured with DXA using a Prody- legy densitometer, GE. Statistical analysis was performed using the «Statistica 6.0» software.

Results: Frequency of sarcopenia in the group of women aged 65 years and older was 7 %. Quartile analysis of women taking into account their ASMI revealed that the women of Q1 and Q2 groups had the following anthropometric characteristics significantly reduced: weight (Q1 = 70.90 kg, Q2 = 70.25 kg, Q3 = 74.75 kg, Q4 = 85.53 kg; F = 5.24; p=0.002), neck circumference (Q1 = 350 mm, Q2 = 357 mm, Q3 = 376 mm, Q4 = 393 mm; F= 5.68; p=0.001), abdomen circumference (Q1 = 846 mm, Q2 = 936 mm, Q3 = 1008 mm, Q4 = 1106 mm; F= 11.52; p<0.0001), shoulder width (Q1 = 903 un., Q2 = 963 un., Q3 = 1029 un., Q4 = 1078 un.; F = 2.22; p=0.09), narrow tibia circumference (Q1 = 221 mm, Q2 = 227 mm, Q3 = 244 mm, Q4 = 248 mm; F=6.44; p=0.0006). We also observed an significantly lower thorax circumference in the Q1 group (Q1 = 903 mm, Q2 = 963 mm, Q3 = 1029 mm, Q4 = 1079 mm; F=3.82; p=0.01) in comparison with the women of Q4 group (Q1 = 903 mm, Q2 = 963 mm, Q3 = 1029 mm, Q4 = 1079 mm; F=3.82; p=0.01).

Conclusion: In women with a lower ASMI (Q1 and Q2 groups) the following anthropometric characteristics were significantly lower: weight, neck circumference, abdomen circumference, shoulder width, narrow tibia circumference. Thus, we can use anthropometric measures to determine groups with an increased risk of sarcopenia and its complications.

IBDW2014-00076-F008
BONE MINERAL DENSITY, SPINAL MICRO-ARCHITECTURE (TBS DATA) AND BODY COMPOSITION IN THE OLDER UKRAINIAN WOMEN WITH VERTEBRAL FRAILITY FRACUTRES
V. Povoroznyuk, N. Dzerovych
D.F. Chebotarev Institute of gerontology NAMS Ukraine, Kyiv, Ukraine

Introduction: Osteoporosis and sarcopenia are the most frequent musculoskel- etal disorders affecting older people. Fracture incidence as well as the number of fractures increase with population ageing. A low skeletal muscle mass is associated with the poor structural bone parameters and impaired balance in elderly people. The aim of this study is to evaluate the bone mineral density (BMD), trabecular bone score (TBS) and body composition in women taking into account the presence of vertebral fragility fractures (VFF).

Materials and methods: We’ve examined 171 women aged 65-89 years (mean age = 73.12±0.39 yrs; mean height = 1.58±0.004 m; mean weight = 72.54±0.99 kg). The patients were divided into groups depending on presence of VFF: A – no VFF; B – presence of VFF (n=66; mean age = 73.79±0.55 yrs; mean height = 1.58±0.008 m; mean weight = 69.53±1.37 kg). Total body, lumbar spine, femoral neck, forearm BMD, lateral vertebral assessment, trabecular bone score (L1-L4), lean and masses were measured by DXA densitometer (Prodigy, GE). Appendicular skeletal mass (ASM) was measured at all the four limbs with DXA. We’ve also calculated the appendicular skeletal mass index (ASMI) according to the formula ASM/height2 (kg/m2).

Results: We have found the following parameters to be significantly lower in women with VFF compared to women having no VFF: BMD of total body (A – 0.859±0.01 g/cm², B – 0.784±0.02 g/cm²; p<0.05), spine (A – 1.038±0.02 g/cm², B – 0.927±0.03 g/cm²; p<0.05), femoral neck (A – 0.787±0.01 g/ cm², B – 0.711±0.01 g/cm²; p<0.05), 33% forearm (A – 0.690±0.01 g/cm², B – 0.600±0.01 g/cm²; p<0.05), TBS (A = 1.171±0.01, B = 1.116±0.02; p<0.05), whole-body fat mass (A = 30736.87±939.92 g, B = 25877.45±966.90 g; p<0.05), whole-body lean mass (A = 41202.44±498.18 g, B = 39440.77±954.78 g; p<0.05), ASM (A = 16.47±0.22 kg, B = 15.81±0.22 kg; p<0.05) and ASMI (A – 6.59±0.07 kg/m², B – 6.34±0.09 kg/m²; p<0.05). The frequency of sarcopenia was 2% in women with no VFF and 14% in women with VFF.

Conclusion: Women with VFF have a significantly lower BMD, TBS, lean and fat mass compared to women with no VFF.

IBDW2014-00077-F009
IS TBS DIFFERENT IN HEALTHY EUROPEAN CAUCASIAN MEN AND WOMEN?: CREATION OF NORMATIVE SPINE TBS DATA FOR MEN
V. Povoroznyuk a, b, C. Battistac, F. Michelet a, c, N. Dzerovych a, b, A. Mustienko d, R. Winzenrieth c
aInstitute of Gerontology NAMS, Kiev, Ukraine
bCetr Group Medic, Barcelona, Spain
cR&D department, Med-Imaps, France

Introduction: Trabecular Bone Score (TBS, Med-Imaps, France) is an index of bone microarchitectural texture extracted from antero-posterior spine DXA. In this cross-sectional analysis from two facilities in Ukraine and Spain, we have investigated the age-related changes of the lumbar vertebral microarchitectural architecture assessed by TBS in a cohort of Caucasian men and compare the results to TBS reference data for Caucasian women.

Methods: Subjects in the study were Ukrainian and Spanish men aged 40 and older with a BMD Z-score at spine L1-L4 within ±2SD. Individuals were excluded if they had fractures, were on any osteoporosis treatment and/or had any illness that would be expected to impact bone metabolism. All data have been obtained from GE-Lunar DXA devices (Prodigy and Idx, Madison, WI, USA). Cross-calibration between the two centers was performed for TBS. TBS was evaluated at spine L1-L4 but also for all possible vertebral combinations.

Results: A database of 368 men aged 40 to 90 years was created. TBS and BMD values at L1-L4 were poorly correlated with BMI (r = 0.16 and 0.22). TBS was poorly correlated with weight (r = 0.1) and height (0.03) whereas higher correlations were obtained for BMD (r=0.3 and 0.2). TBS values ob- tained for all lumbar vertebral combinations decreased significantly with age. There was a linear decrease of 13.5% (−1.75 T-score) in TBS at L1-L4 between 40 and 90 years of age in men while a decrease of 16.7% (−2.58 T-score) was observed in women (Dufour et al., 2012). As opposed to women, there is no change in the rate of TBS decrease after 65 years in men.

Conclusion: This study established for the first time TBS age related curve in European men in the lumbar spine. The decrease seen in lumbar TBS reflects age-related micro-architecture texture changes at spine. Within the 40-65 age range, similar TBS decrease was observed in both Caucasian men and women (p=0.8). After 65, TBS decrease was significantly higher in women than men (p=0.01). This study confirms the need to use gender specific reference data.