is the identification of in-hospital complication (pneumonia), which should be actively monitored in these patients.

References:

- [1] Falaschi P (Paolo), Marsh DR. Orthogeriatrics. Springer; 2017.
- [2] Cooper C, Campion G, Melton LJ. Hip fractures in the elderly: A world-wide projection. *Osteoporos Int*. 1992 Nov;2(6):285–9.
- [3] Mohd-Tahir NA, Li SC. Economic burden of osteoporosis-related hip fracture in Asia: a systematic review. Vol. 28, *Osteoporosis International*. Springer London; 2017. p. 2035–44.
- [4] Solimeo SL, McCoy K, Reisinger HS, Adler RA, Sarrazin MV. Factors Associated With Osteoporosis Care of Men Hospitalized for Hip Fracture: A Retrospective Cohort Study. 2019;

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.5129

AB0912

CLINICAL UTILITY OF THE WARD TRIANGLE OF HIP BONE DENSITOMETRY: DATA FROM AN FLS UNIT

J. Rosas¹, A. Pons¹, C. Cano¹, E. Ivars², M. Lorente Betoret², J. M. Senabre Gallego¹, G. Santos Soler¹, J. A. Bernal², J. A. García-Gómez³, X. Barber⁴ on behalf of AIRE-MB Group. ¹Hospital Marina Baixa, Rheumatology, Villajoyosa (Alicante), Spain; ²Hospital Marina Baixa, Rheumatology, Villajoyosa (Alicante), Spain; ³Hospital General Universitario de Elche, Infectious Disease, Elche, Spain; ⁴Universidad Miguel Hernández de Elche, CIO, Elche (Alicante), Spain

Objectives: To evaluate the clinical utility of Ward's triangle (W) of bone densitometry (BMD) of the hip in a population of postmenopausal women referred to BMD from a FLS Unit coordinated by Rheumatology (FLS-REU).

Methods: Retrospective study, which includes, after informed consent, postmenopausal women referred by any department of specialized medicine or primary care medicine, of the health department, to the FLS-REU Unit of our center, during the period of February 2010 to October 2019.

General patient data were collected (age, gender), and risk factors for OP. BMD of the lumbar spine (CL) and hip (femoral neck, total hip and W) was performed, except if there was lumbar surgery, severe scoliosis, or a bilateral hip prosthesis. The BMD outcome was distributed in normal (T index [Ts] to -1 SD), osteopenia (Ts: -1.1 to -2.5 SD) and OP (Ts: <-2.5 SD), separated into two groups: mild OP-moderate (Ts: from <-2.5 DE to -3 DE) or severe OP (Ts: <-3 DE).

Results: 5,740 postmenopausal women referred for BMD are included, with the W result available (Table 1). The result of the mean Ts (SD) was: in CL: -1.49 (1.48) SD, femoral neck: -1.33 (1.11) SD and in W: -2.05 (1.12) SD. In 947 (16%) women, the W was normal, with a mean Ts: -0.28 (1.12) SD; osteopenia in 2,606 (45%): -1.83 (1.12) SD and OP in 2,197 (39%) SD, of which 1,010 (61%) had mild-moderate OP and 967 (49%), severe OP.

The table shows the BMD results of W and CL, the correlation coefficient between them being 0.52 (0.5-0. P < 0.001), although with a Kappa coefficient of 0.26 (0.24-0.28. P = 0). The probability that a result in W of normal BMD is normal also in CL is 73% (70% -76%), in osteopenia in both: 47% (45% -49%) and OP: 46% (44 % -48%). In the analysis by ROC curve, the cut-off point of Ts in W for osteopenia in CL is -1.85 SD (sensitivity: 0.648, specificity: 0.649, with AUC: 0.0702. [0.687-0.716]) and for OP in CL -2.35 DE (sensitivity: 0.69, specificity: 0.70, with AUC: 0.757 [0.744-0.770]).

LUMBAR SPINE (LS)				
	Normal	Osteopenia (OP)	OP <-2.5 a -3 SD	OP <-3.0 SD
Ward normal	681	211	39	26
N (%): 947 (16)	0.41±1.78	-1.61±1.78	-2.95±1.78	-2.7±1.78
Tscore: -0.28 ± 1.12 SD				-3.46±1.78
Ward osteopenia	899	1,192	463	310
N (%): 2,606 (45)	-0.07±1.48	-1.73±1.48	-2.96±1.48	-2.72±1.48
Tscore: -1.83±1.12 SD				-3.43±1.48
Ward Osteoporosis	346	800	975	-
N (%): 2,187 (39)	-0.19±1.48	-1.83±1.48	-3.23±1.48	-
Tscore: -3.07±1.13 SD				-
Ward Osteoporosis <-2.5 a -3 SD	188	416	-	173
N: 1,010 (51)	-0.16±1.48	-1.83±1.48	-	-2.77±1.48
Tscore: -2.78±1.12 SD				-3.08±1.48
Ward Osteoporosis <-3 SD	114	304	-	193
N: 967 (49)	-0.24±1.48	-1.84±1.48	-	-2.78±1.48
Tscore: -3.51±1.13 SD				-3.73±1.48

Conclusion: 1.For clinical practice, the usefulness of the W result is low, although if the BMD result is normal, there is a 73% probability that in CL it will also be. 2. The correlation between the result of W and CL, although significant, is slight. 3. The cut-off points of Ts, with better sensitivity and specificity, that correlate a W osteopenia or osteoporosis with the result in CL is -1.85 and -2.35 SD, respectively.

Acknowledgments: The study was supported by a research grant from the Association for Research in Rheumatology of the Marina Baixa (AIRE-MB).

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.4765

AB0913

PREDICTING PATIENTS AT RISK OF FRAGILITY FRACTURE WITH NORMAL BONE MINERAL DENSITY: AN OBSERVATIONAL STUDY

C. Saleh¹, M. Bukhari¹, S. M. Bilgrami¹. ¹Royal Lancaster Infirmary, Rheumatology, Lancaster, United Kingdom

Background: There is an increased risk of low-trauma fracture as bone mineral density (BMD) decreases, however a large proportion of these fragility fractures occur in those without osteoporosis or osteopenia. The widely used FRAX tool uses femoral neck (FN) BMD, amongst other parameters, to predict fracture risk. In those with normal BMD, data is lacking on the weight these other parameters hold in predicting future risk. Indeed, FN BMD can be facultative in the estimation of risk when using FRAX.

Objectives: To establish predictors of fragility fracture in a patient cohort referred for BMD estimation, subsequently found to have bilateral FN BMD of greater than 1.

Methods: A cohort of patients in the North West of England referred between 2004 and 2014 for BMD estimation, with both left and right FN BMD of greater than 1 were identified. Patient parameters identified and analysed included age at scan, gender, BMD at left hip, body mass index (BMI), fat mass, family history of fracture, alcohol history of 3 or more units per day, smoking status, rheumatoid arthritis (RA), and steroid exposure. Patients with fragility fracture were compared with those without fracture. Chi-square test and T-test were applied to categorical and continuous data respectively. Further univariate and multivariate logistic regression models were fitted to determine parameters associated with future fracture risk.

Results: 619 patients with bilateral FN BMD of greater than 1 were identified and included in analysis. Mean age at scan was 54 years (SD 11.82) and 542 (87.56%) were female. 92 (14.86%) patients had a fragility fracture. Mean left FN BMD was 1.91 (SD 0.71), and mean right FN BMD was 1.92 (SD 0.68). Results of the univariate analysis are described in Table 1 below.

Table 1. Logistic regression analysis of patient parameters with unadjusted and adjusted odds ratios for fragility fracture

Predictor	Unadjusted odds ratio (95% CI)	Odds ratio adjusted for age (95% CI)	Odds ratio adjusted for age and gender (95% CI)
Age at scan (years)	0.99 (0.98-1.01)	-	-
Gender	1.37 (0.66, 2.84)	1.34 (0.64, 2.80)	-
BMD at left hip	0.34 (0.03, 4.05)	0.37 (0.03, 4.37)	0.50 (0.03, 7.67)
BMI	1.07 (1.03, 1.10)	1.07 (1.03, 1.10)	1.07 (1.03, 1.10)
Fat mass	1.00 (1.00, 1.00)	1.00 (1.00, 1.01)	1.00 (1.00, 1.01)
Parent fractured hip	0.99 (0.57, 1.70)	0.97 (0.56, 1.68)	0.94 (0.54, 1.64)
Alcohol (3 or more units/day)	1.16 (0.47, 2.86)	1.16 (0.47, 2.87)	1.16 (0.47, 2.89)
Current smoker	1.40 (0.89, 2.21)	1.40 (0.89, 2.21)	1.42 (0.90, 2.23)
Rheumatoid arthritis	0.83 (0.32, 2.19)	0.85 (0.32, 2.24)	0.86 (0.34, 2.27)
Steroid exposure	0.53 (0.30, 0.96)	0.53 (0.30, 0.96)	0.54 (0.30, 0.98)

Conclusion: Steroid exposure and body composition parameters influence fracture risk in this group of patients with normal BMD, further work will be done looking at the types of fractures and other parameters in this group of patients.

Disclosure of Interests: Christopher Saleh: None declared, Marwan Bukhari Speakers bureau: Bristol-Myers Squibb, UCB celltech, Roche/Chugai, Pfizer, Abbvie, Merck, Mennarini, Sanofi-aventis, Eli-Lilly, Janssen, Amgen and Novartis., Syed Mujtaba Bilgrami Speakers bureau: Pfizer

DOI: 10.1136/annrheumdis-2020-eular.4544

AB0914

BONE LOSS AND NEW FRACTURES WITH DENOSUMAB TREATMENT

C. Sanguesa¹, I. Casafont-Solé¹, A. Nack¹, S. Holgado Pérez¹, M. Martínez-Morillo¹, M. Aparicio Rovira¹, Á. Prior-Español¹, M. Aparicio Espinar¹, A. Riveros¹, L. Mateo¹, A. Olive¹, L. Gifre¹. ¹Germans Trias i Pujol University Hospital, Rheumatology, Badalona, Spain

Background: The incidence and factors related to an inadequate response to denosumab (Dmab) treatment remain unclear.

Objectives: To describe clinical, analytical and densitometric characteristics of patients with inadequate response (IR) to Dmab in clinical practice. IR was defined as the presence of a new fracture [fxs-IR] or a significant decrease in BMD ($\geq 5\%$ lumbar or $\geq 4\%$ femoral) [BMD-IR].

Methods: retrospective study of patients with IR to Dmab treatment. Data of demographic variables, risk factors for osteoporosis, history of fractures, previous anti-osteoporotic treatment, densitometric and analytical parameters were collected before and after IR.

Results: 22 patients were included (19W:3M) with mean age of 75 ± 10 years. The causes of osteoporosis were: postmenopausal (50%), induced by glucocorticoids (22.7%), alcoholic (9.09%) and multifactorial (18.8%). Most patients were previously treated with bisphosphonates (59.09%, duration 5.2 ± 2.6 y) and had previous vertebral fractures (54.54%, median 3).

During Dmab treatment, 10 patients presented a BMD-IR (with a mean bone loss up to -3.5% at femur and -5.8% at lumbar spine) and 12 had fxs-IR (vertebral [n=8], humerus [n=1], pelvis [n=1], tibia [n=1]). No significant differences were observed in duration of Dmab between both IR groups (Fxs-IR: 3.2 ± 1.9 vs BMD-IR: 2.4 ± 1.2 y). In the BMD-IR, the BMD loss was higher at lumbar spine than at total hip ($-6.6\% \pm 3.7$ vs $-1.9\% \pm 4.8$). Only 1 patient of the fxs-IR had a secondary cause of IR (myeloma multiple).

In the fxs-IR group, most patients started combined treatment with teriparatide (n=4), 1 changed to teriparatide and 7 remained with Dmab. In the BMD-IR group, most maintained Dmab treatment (n=8) and 2 switched to zoledronate.

Conclusion: Most patients who developed IR to Dmab had been previously treated with bisphosphonates and had previous fragility fractures and appears within the first 3 years of treatment. BMD loss seems to be more marked at spine than total hip. Only one patient had a secondary cause of IR.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.6218

AB0915

BONE MINERAL DENSITY AND FRACTURE FREQUENCY IN PREMENOPAUSAL WOMEN WITH RHEUMATIC DISEASES

N. Toroptsova¹, O. Dobrovolskaya¹, O. Nikitinskaya¹, N. Demin¹, A. Smirnov¹, L. Shornikova¹. ¹V.A. Nasonova Scientific and Research Institute of Rheumatology, Moscow, Russian Federation

Background: The onset of the disease in young and middle age is typical for rheumatic diseases (RDS), but most studies on osteoporosis were conducted in patients (pts) older than 50 years, which included postmenopausal women.

Objectives: To assess bone mineral density (BMD), fracture frequency and the factors associated with low BMD in premenopausal women with RDs.

Methods: 160 women (median age, 36 [29; 43] years): 120 pts with RDs (43 rheumatoid arthritis (RA), 53 systemic sclerosis (SSc) and 24 psoriatic arthritis (PsA)) and 40 age-matched healthy controls were enrolled in the study. We performed a dual-energy X-ray absorptiometry (DXA, Hologic Discovery A, USA) to measure BMD in lumbar spine, femoral neck and total hip. BMD decreasing grade was evaluated by the Z-score $< -2SD$. All pts were interviewed using a unified questionnaire including assessment of daily dietary calcium intake. Serum vitamin D, C-reactive protein and erythrocyte sedimentation rate (ESR) measurements were done.

Results: 25% pts with RDs and only 8% healthy controls have low BMD ($p=0.02$). RA, SSc and PsA pts had low BMD in 37%, 21% and 13%, respectively, that was more often than in healthy women ($p=0.004$, $p=0.046$ and $p=0.081$, respectively). 9.3% RA pts and 7.5% SSc pts had low energy fractures. BMD of RDs pts in all areas of measurement demonstrated a direct correlation with height, weight, body mass index, and serum vitamin D concentration and an inverse correlation with the cumulative dose of glucocorticoids. Also, proximal femur BMD inversely correlated with RDs duration. BMD of femoral neck and total hip inversely correlated with C-reactive protein level in SSc pts. In RA women we found a direct correlation between lumbar spine and femur neck BMD and ESR.

Conclusion: 25% of premenopausal women with RDs had reduced BMD and needed monitoring and osteoporosis prevention, while 9.3% pts with RA and 7.5% women with SSc needed anti-osteoporotic treatment.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.2740

AB0916

FACTORS THAT DEMONSTRATED SIGNIFICANT CORRELATION WITH BONE MINERAL DENSITY GAIN WITH DENOSUMAB ADMINISTRATION FOR PATIENT WITH RHEUMATOID ARTHRITIS

I. Yoshii¹. ¹Yoshii Hospital, Department of Rheumatology and Musculoskeletal Medicine, Shimanto-City, Japan

Background: Denosumab, a monoclonal antibody of receptor activator of NF- κ B ligand promotes a strong action for bone mineral density (BMD) gain. This agent is often used for patient with rheumatoid arthritis (RA) because of its strong anti-osteoclastogenesis action, with that joint structural damage is induced. However, factors what affects BMD gain for patient with RA is still unclear.

Objectives: Factors that may affect BMD gain for patient with RA is evaluated statistically.

Methods: Patients with RA to whom denosumab is administrated consecutively three shots or more were picked up. BMD in lumbar spine (LS) and femoral neck (FN) measured with dual-energy X-ray absorptiometry was routinely measured at the initial administration (BL). BMDs were measured every six months when another denosumab is administrated. Change of BMD for each bone was calculated. Patient's age at BL, at onset of RA, disease duration, sex, anti-cyclic citrullinated polypeptide antibodies (ACPA), whether denosumab is naïve, body mass index (BMI) at BL were harvested. BMD in each bone, serum tartrate resistant acid phosphatase 5b (TRACP5b), total type one procollagen-N-peptide (P1NP), calcium (Ca), creatinine (Cr), cystatin C (CysC), estimated glomerular filtration ratio based on CysC (eGFR), serum Cr-to-CysC ratio (Cr/CysC), and Barthel Index, were measured at BL and every six months thereafter. Relationship between BMD gain from BL to second administration and such like factors at BL were evaluated with linear regression analysis at first with univariate model and then multivariate model with factors that demonstrated statistical significance within 5%. Binary logistic regression analysis for these factors was also performed according to BMD gain. These procedures were performed as a same manner regarding with BMD gain from BL to third administration.

Results: A total of 397 patients with 43 males (10.4%) and 354 females (89.6%) were recruited. Average age was 81.3 and average disease duration of RA was 6.9 years. 227 patients (57.4%) was denosumab naïve, and prior to BL, 170 patients were already administered with alendronate in 26, risedronate in 26, minodronate in 23, ibandronate in 12, raloxifene in 39, bazedoxifene in 7, teriparatide in 36.

BMD gain in LS from BL to the second administration demonstrated significant correlation with age and TRACP5b at BL with univariate model, and only aging correlated significant negative correlation with BMD gain with multivariate model. In binary logistic regression analysis, aging demonstrated no significant regression with BMD gain. From BL to third administration, BMD gain also demonstrated significant correlation with aging, but no correlation with TRACP5b, but Cr/CysC at BL. These two factors also demonstrated significant correlation with BMD gain in LS, in these aging demonstrated negative and Cr/CysC demonstrated positive correlation. Cr/CysC demonstrated significant regression with BMD gain in LS from BL to the third with binary logistic regression analysis.

BMD gain in FN from BL to the second administration demonstrated significant correlation with age, BMD in FN at BL, and ACPA with univariate model, and all of the three demonstrated significant correlation with BMD gain with multivariate model. However, no factors demonstrated significant regression with BMD gain with binary logistic regression analysis. From BL to third administration, BMD gain in FN demonstrated significant correlation with aging and BMD in FN at BL. However, BMD in FN at BL demonstrated the only factor to correlate with BMD gain in FN. BMD in FN at BL demonstrated significant regression with BMD gain in FN from BL to the third with binary logistic regression analysis.

Conclusion: These results suggested that BMD gain in LS and FN was affected by different factors. These results may be helpful reference in choosing denosumab against osteoporosis in RA patient.

Disclosure of Interests: None declared

DOI: 10.1136/annrheumdis-2020-eular.3180

Crystal diseases, metabolic bone diseases other than osteoporosis

AB0917

AGE PLAYS A CRUCIAL ROLE IN CRYSTAL ARTHRITIS SEVERITY – A SYNIOVAL FLUID STUDY

B. Anklí^{1,2}, M. B. Bigler³, C. Berger^{4,5}, T. Daikeler¹. ¹University Hospital of Basel, Rheumatology, Basel, Switzerland; ²Schmerzlinik Basel, Rheumatology, Basel, Switzerland; ³University Hospital of Basel, Department of Biomedicine, Basel, Switzerland; ⁴University Hospital of Basel, Translational Immunology, Basel, Switzerland; ⁵University Hospital of Basel, Medical Outpatient Clinic, Basel, Switzerland

Background: Incidence and severity of gout and calcium pyrophosphate deposition disease (CPPD) increase with age (1). Aging is associated with immune senescence, leading to a deregulation of the innate immune system and hence inflammation (2). MRI studies hinted on a significantly higher synovial inflammation in older compared to younger arthritis patients (3). Whether inflammatory