Annual percentage changes of total BMD (g/cm^2) in the PF and LS were computed (annual ΔBMD). The relationship between annual ΔBMD and potential predictors was assessed by independent-samples t-test or Pearson correlations, according to the categorical or continuous nature of the independent variable. The baseline independent variables included were: age (years); gender; body mass index (kg/m^2); smoking, alcohol intake, rheumatoid arthritis, glucocorticoid treatment and secondary osteoporosis according to FRAX algorithm definitions. The follow-up reported calcium/vitamin D supplementation and treatment with bisphosphonates, for at least 1 year (yes/no), were also considered as independent variables. We used linear regression models (enter method) to estimate the possible association between socio-demographic/clinical variables and the BMD changes of PF and LS. The predictor variables included in the model were selected *a priori* based on variables that were associated with annual ΔBMD on univariate analysis. Results were considered significant when $p < 0.05$.

Results: This analysis included data from 636 individuals (mean ($\pm\text{SD}$) age of 53 ± 8 years, 76% female). The mean ($\pm\text{SD}$) follow-up period was 13.6 ± 1.1 years. Baseline mean ($\pm\text{SD}$) BMD of the PF and LS were 0.77 ± 0.004 and 0.94 ± 0.132 , respectively. The mean ($\pm\text{SD}$) percentage of annual bone loss was: -0.19 ± 1.02 for PF and -0.06 ± 0.84 for LS. On univariate analysis, ΔBMD at both the PF and LS was significantly associated with gender ($p < 0.001$). Annual ΔBMD was also associated with vitamin D supplements ($p = 0.014$) at PF, and with calcium supplements ($p = 0.002$) and bisphosphonate treatment ($p = 0.027$) at LS. On multiple linear regression analysis, female gender persisted as a predictor of faster BMD loss in both PF ($p \leq 0.001$) and LS ($p = 0.006$). While bisphosphonate treatment didn't predict the annual bone loss, vitamin D and calcium supplementation persisted as predictors of lower annual ΔBMD at PF ($p = 0.034$) and LS ($p = 0.033$), respectively.

Conclusions: Our results confirm that the rate of BMD loss at PF and LS over 14 years is significantly associated with gender. Vitamin D and calcium supplementation appeared to have a role in the prevention of bone loss in this general population cohort.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.5293

THU0492 PRELIMINARY STUDY OF THE BONE MASS IN LUNG TRANSPLANTED PATIENTS IN TREATMENT WITH DENOSUMAB

M. Barceló-Bru, B. Rodríguez-Diez. *Rheumatology Unit, Hospital Universitari Vall d'Hebron, Barcelona, Spain*

Background: Osteoporosis(OP) is a known complication before and after a lung transplant. In addition to altering bone mass, treatment with glucocorticoids alters the bone microarchitecture, conditioning an increased risk of fracture in these patients. Denosumab(Dmab) is a monoclonal antibody approved for the treatment of postmenopausal OP and its use for corticoid OP is pending approval.

Objectives: To describe the subcohort of lung transplant patients who have been treated with Dmab. To study the evolution of bone mass in patients with lung transplantation, with OP induced by glucocorticoids, treated with Dmab.

Methods: We included 19 lung transplant patients between 1995 and 2017 controlled in rheumatology for OP and in treatment with Dmab. Of these 19 patients, the evolution of bone mass of the 9 patients who have completed a minimum of 12 months of treatment is shown. Bone densitometry(DXA) was performed on a General Electric Healthcare Lunar Prodigy Advance 15 version densitometer, before and after treatment with Dmab. Demographic data of the patients were collected, the diagnosis of the disease that motivated the transplant, the glucocorticoid doses before and after the transplant, as well as the immunosuppressive treatment. In the 9 patients with DXA follow-up, the 3D-SHAPER software was applied in the DXA before and after the transplant.

Results: We included 19 patients(10 women) with a mean age of 58.6 ± 11.4 . The diagnosis of the disease that led to the transplant was in 4 COPD patients, 6 patients with pulmonary fibrosis or diffuse interstitial disease, 2 with bronchiectasis, 2 patients with cystic fibrosis, 1 with histiocytosis X, 2 with lymphangioleiomyomatosis, 1 with bronchiolitis obliterans and 1 patient with pulmonary hypertension. Before transplantation, 8 patients (42.1%) had required high doses of glucocorticoids. The prevalence of OP prior to start Dmab treatment in the 19 lung transplant patients was 94.7%. The means of BMD in g/cm^2 and T-score before treatment with Dmab and the results of the 3D-SHAPER are shown in table 1.

	DMO g/cm^2	T-score
Lumbar spine	0.909 ± 0.13	-2.40 ± 1.08
Femoral Neck	0.708 ± 0.94	-2.50 ± 0.77
Total Hip	0.702 ± 0.86	-2.73 ± 0.59
Cortical Density (g/cm^2)	109.3 ± 7.7	-2.9 ± 0.3
Trabecular vBMD (g/cm^3)	85.7 ± 21.4	-2.9 ± 0.8
Integral vBMD (g/cm^3)	198.7 ± 19	-3.3 ± 0.5

The mean time in which the DXA was performed prior to the treatment with Dmab with respect to the transplant date was 4.31 ± 5.83 years. The mean time in which the DXA was performed after the start of Dmab was 19 ± 4.17 months. The results of the evolutionary BMD, the 3D-SHAPER study and its percentage of change are shown in table 2. Of these 9 patients, 88.9% had received osteoactive treatment before Dmab, 5 with oral bisphosphonates and 3 with endovenous bisphosphonates. The mean time of treatment with bisphosphonates until the onset of Dmab was 5.4 years. There were no significant differences in BMD evolution between patients treated for OP prior to Dmab and those not treated, nor for 3D-SHAPER.

	Tx (9)	
OP pre-Dmab	8 (88,9%)	
OP post-Dmab	8 (88,9%)	
DMO post-Dmab (mean)	g/cm^2	T-score
- L1-L4	$0,949 \pm 0,13$	$-2,05 \pm 1,07$
- CF	$0,722 \pm 0,12$	$-1,86 \pm 2,22$
- FT	$0,696 \pm 0,06$	$-2,76 \pm 0,49$
% change DMO		
- L1-L4	$8,42 \pm 6,64^*$	
- CF	$2,21 \pm 6,55^*$	
- FT	$2,80 \pm 3,56^*$	
High GC dose pre-Transplant	2 (22,2%)	
3D-SHAPER (mean):		
- Cortical Density (g/cm^2)	$113,7 \pm 10$	
- Trabecular vBMD (g/cm^3)	$88,5 \pm 23,7$	
- Integral vBMD (g/cm^3)	$203,7 \pm 24,4$	
% change 3D-SHAPER:		
- Cortical Density	$4,13 \pm 4,5$	
- Trabecular vBMD	$3,4 \pm 10,9$	
- Integral vBMD	$2,6 \pm 7,7$	

Conclusions: All patients who started treatment with Dmab had a diagnosis of OP except one patient with osteopenia. The mean increase in BMD in patients treated with Dmab was significant in all the regions assessed, being higher in the lumbar spine. There was an increase in cortical density, trabecular volumetric BMD and integral volumetric BMD after Dmab treatment, although this increase was not significant for any of the three parameters.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.4717

THU0493 ARE BISPHOSPHONATES SOLELY RESPONSIBLE FOR ATYPICAL FEMORAL FRACTURES? A CASE SERIES

M.S. Jamal, C. Cockill, S. knights. *Rheumatology, YDH, Yeovil, UK*

Background: Atypical femoral fracture (AFF) is an uncommon but important type of fracture. It is concerning because of the associated morbidity, bilateral nature of the condition and delay in healing which has significant implications on the health of the patients.

Objectives: To identify other risk factors contributing to development of atypical femoral fractures in our cohort of patients presenting to the fracture liaison service.

Methods: We identified a case series of 18 cases were retrospectively from June 2006 to January 2018 through the cohort of patients presenting to the fracture liaison service at Yeovil District Hospital NHS foundation trust, with features suggestive of Atypical femoral fractures. Individual patient cases were evaluated and notes and images reviewed. Atypical femoral fractures were diagnosed according to the 2013 American society of mineral and bone research (ASMBR) criteria. Demographic and co morbidity status was investigated from case notes. Blood results and dual energy x-ray absorptiometry (DEXA) images were accessed through electronic patient records. The results were compiled with Microsoft excel.

Results: There were total 22 patient episodes, of which 4 patients had bilateral symptoms. Female to male ratio was 21:1. Median age of presentation was 71. The incidence of AFF was more in shaft fractures. 54% cases had prodromal symptoms lasting from 1-3 months. 9 cases had radiographic evidence of stress fractures of whom 6 were not identified until they fractured. 86% cases had either concurrent or previous bisphosphonate therapy. Duration of Bisphosphonate therapy was variable from 12 months to 30 years. 54% were taking Proton pump inhibitors and 41% were on long term glucocorticoids. 9% were active smokers. 50% episodes were in patients having two or more risk factors. 3 patients had no risk factors identified.

Conclusions: Exposure to Bisphosphonates remains a major risk factor for development of AFF but our case series has shown that other risk factors do play an important part eg. prolonged courses of glucocorticoids and Proton pump inhibitor therapy. It is plausible that bisphosphonates are given for prolonged courses in patients on glucocorticoids and this combination seems to be a particular risk. The risk appears to be greater with multiple risk factors. The temporal relationship of fractures with relation to bisphosphonate therapy cannot be determined as it can happen even after the cessation of therapy. Further longitudinal and larger studies are required to identify whether Bisphosphonate would play a role to reduce the risk of Atypical Femoral fractures.

REFERENCES:

- [1] Franceschetti P, Bondanelli M, Caruso G, Ambrosio M, Lorusso V, Zatelli M, Massari L, degli Uberti E. Risk factors for development of atypical femoral fractures in patients on long-term oral bisphosphonate therapy. *Bone* 2013;56(2):426–431.
- [2] Saita Y, Ishijima M, Mogami A, Kubota M, Baba T, Kaketa T, Nagao M, Sakamoto Y, Sakai K, Homma Y, Kato R, Nagura N, Miyagawa K, Wada T, Liu L, Matsuoka J, Obayashi O, Shitoto K, Nozawa M, Kajihara H, Gen H, Kaneko K. The incidence of and risk factors for developing atypical femoral fractures in Japan. *Journal of Bone and Mineral Metabolism* 2014 33 (3):311–318.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.7058

THU0494

THE EFFICACY OF DENOSUMAB IN GLUCOCORTICOID-INDUCED OSTEOPOROSIS DID NOT DEPEND ON PRIOR TREATMENT BUT WAS AFFECTED BY THE DOSAGE OF GLUCOCORTICOID

N. Iwamoto¹, Y. Ueki², T. Aramaki², K. Ichinose¹, K. Eguchi², A. Kawakami¹.

¹Department of Immunology and Rheumatology, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki; ²Department of Rheumatology, Sasebo Chuo Hospital, Sasebo, Japan

Background: Despite of the good clinical efficacy of denosumab for primary osteoporosis, 2017 American College of Rheumatology guideline for treatment of glucocorticoid-induced osteoporosis (GIOP) placed denosumab as second-line treatment because of lack of clinical experiences with concomitantly use of immunosuppressive agents. Moreover, recently large phase 3 study in primary osteoporosis revealed that transition from teriparatide to denosumab continuously increased bone mineral density (BMD)¹. However, there is still remain unclear whether prior treatment affect to the efficacy of denosumab in GIOP.

Objectives: The aim of this study is to compare the therapeutic effect of denosumab in GIOP between previous anti-osteoporotic treatments, and to investigate the factor that influence the efficacy of denosumab in GIOP.

Methods: Sixty-six patients for whom treated by denosumab, were enrolled. All patients were receiving several dosages of prednisolone (PSL) (2–20 mg) for RA and connective tissue diseases at initiation of denosumab. 23 patients had been treated with daily teriparatide and 27 patients had been treated with bisphosphonate (BPs) prior to denosumab. The rest 16 patients had not been treated by anti-osteoporosis medication at initiation of denosumab. We evaluated BMD at lumbar spine and bone turnover markers (NTX, BAP and P1NP) every 6 months for 12 months. The changes in BMD was compared among these 3 groups at 6 months and at 12 months. To assess the factors which influences clinical response of denosumab in GIOP, univariate and multivariable ordinal logistic regression analyses were used.

Results: Mean percentage change in BMD of lumbar spine from baseline to 6 and 12 months were significant (2.85% increased; $p < 0.0001$ and 4.40% increased; $p < 0.0001$, respectively). Gains higher than 3% were observed in 68.2%. Whereas, the subjects who showed decrement of BMD at 12 months were few (16.67%). All bone turnover markers determined in this study were decreased at 6 months. Transition from BPs to denosumab further increase BMD at 12 months as compared to transition from teriparatide to denosumab (4.71% increased, 3.71% increased, respectively). However, difference among these 2 groups was not significant and furthermore, the changes in BMD in patients who did no transition from anti-osteoporosis medication to denosumab also showed no significant difference (figure 1). Univariate analysis showed that dosage/duration of PSL, body weight and gender were associated with BMD increase higher than 3% at 12 months. Among these candidates, multivariable logistic analysis showed that dose of PSL was independently associated with clinical response of denosumab (OR 1.36, 95% CI 1.045–1.761 $P < 0.01$). No hypocalcemia and osteonecrosis of the jaw was observed during the study period.

Conclusions: Our present study demonstrated that denosumab increased BMD in GIOP regardless of prior anti-osteoporotic treatment in 'real-world' settings. We should consider denosumab treatment for GIOP, especially who are treated by much dose of glucocorticoids or at the time when the efficacy of BPs is diminished.

REFERENCE:

- [1] Leder BZ, et al. Denosumab and teriparatide transitions in postmenopausal osteoporosis (the DATA-Switch study): extension of a randomised controlled trial. *Lancet* 2015;386(9999):1147–55.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.6430

THU0495

INDICES OF VERTEBRAL PAIN SYNDROME, PHYSICAL PERFORMANCE AND QUALITY OF LIFE IN OLDER AGE WOMEN WITH VERTEBRAL FRACTURES DEPENDING ON THEIR QUANTITY AND LOCALIZATION

N. Grygorieva, V. Povronyuk, O. Rybina. State Institution «Institute of Gerontology Named after D. F. Chebotarev of Nams Ukraine», Kyiv, Ukraine

Background: Nowadays, vertebral fractures (VF) are one of the frequent and severe complications of systemic osteoporosis, which lead to severe spine pain, restriction of physical activity, increased disability and mortality, however, the data about their particularities depending on their quantity and localization are limited. The purpose was to study the indices of vertebral pain syndrome, physical performance, disability and quality of life in women of older age groups with VF depending on their number and localization.

Objectives: We examined 230 women aged 50–89 years old, which were divided into 2 groups: I – patients without any history of osteoporotic fractures (n=151), II – women with VF at thoracic and/or lumbar spine (n=79). Subsequently, the persons of the second group were divided into subgroups depending on the number (1 or 2 and more) and localization (thoracic, lumbar spine or combined) VF.

Methods: The presence and intensity of pain in the thoracic and lumbar spine were evaluated using the 11-component visual analogue scale (VAS), the level of physical performance was evaluated using static and dynamic functional tests (FT) (Thomayer, Schober tests, chest excursion, lateral trunk lean, 3-, 4-, 15-metre tests, "stand up from the chair", static balancing); disturbance of life was determined using Roland-Morris questionnaire, quality of life - EuroQol-5D questionnaire.

Results: It was demonstrated that the intensity of vertebral pain (pain at the time of investigation, the most common level of pain, pain in the best periods of the disease) is significantly worse in women with VF than corresponding parameters in persons without fractures. It was found that women with 2 and more VF have worse values of majority of measured FT (results of Schober test, lateral trunk lean, chest excursion, breath holding, hand grip strength, 15-metre test) in comparison with control group, while in women with 1 VF only results of Schober test and breath holding were significantly worse than same ones in control group. It was shown that for women with VF at the thoracic spine, results of breath holding