Objectives: We wished to assess volumetric bone mineral density (BMD) by forearm QCT in conjunction with dual-energy X-ray absorptiometry (DXA) and bone biomarkers in RA and AS.

Methods: Forty RA and AS patients treated with etanercept (ETN) or certolizumab pegol (CZP) were included in a 12-month follow-up study. Peripheral QCT and DXA BMD were determined. Bone biomarkers, such as PTH, osteocalcin, RANKL, 25-hydroxyvitamin D (VITD), P1NP, CTX, sclerostin, DKK-1 and cathepsin K (CATHK) were assessed by ELISA.

Results: There was no further bone loss during anti-TNF treatment. Volumetric and areal BMD showed significant correlations with each other ($p < 0.05$). Total QCT BMD after 12 months was inversely determined by disease activity at baseline in the full cohort ($p = 0.030$). Cortical BMD was negatively determined by baseline disease activity ($p = 0.005$) and CATHK ($p = 0.025$). In RA, VITD-0 determined QTRABMD-12 ($p = 0.005$). In the full cohort, the one-year change in QTRABMD was related to TNF inhibition together with higher VITD-0 ($p = 0.031$). Therapy and lower CATHK determined QCORTBMD changes ($p = 0.006$). In RA, treatment together with VITD-0 ($p < 0.01$) or CATHK-0 ($p = 0.002$), while in AS, treatment together with RANKL-0 ($p < 0.05$) determined QCT BMD changes.

Conclusion: QCT confirmed that biologics may attenuate bone loss. Disease activity, CATHK, RANKL and VITD may predict the effects of anti-TNF treatment on volumetric BMD changes. There may be differences between RA and AS in this respect.

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POS0044 T315 SUPPRESSES OSTEOGENIC DIFFERENTIATION IN SAOS-2 CELLS BY INHIBITING PHOSPHORYLATION OF AKT

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Background: New bone formation is common in the late stage of various inflammatory arthritis, while osteoblasts play a vital role in this process. Activation of PI3K/ Akt pathway promotes the differentiation and enhances the function of osteoblasts [1]. T315 is a novel small molecule drug, which may induce apoptosis and suppress the expression of cellular markers of chronic lymphocytic leukemia cells by disrupting PI3K/ Akt pathway [2]. However, the lack of study focuses on the influence of T315 on the other cells, except tumor cell lines.

Objectives: We aimed to assess the effect of T315 on human osteoblast-like Saos-2 cells, while its potential mechanism in PI3K/ Akt pathway was evaluated as well.

Methods: (1) Saos-2 was stimulated with an osteogenic reagent which contained L-ascorbic acid, β -glycerophosphoric acid, and dexamethasone. The concentration of T315 was adjusted to 0 μ g/ml, 1 μ g/ml, and 2 μ g/ml in the culture medium. (2) Alizarin red stain and alkaline phosphatase (ALP) stain were performed at d0, d7, d14, and d21 after being treated with T315. (3) Cellular protein was extracted at d0, d3, and d6 after being treated with T315, then ALP activity was tested based on a recommendation from the manufacturer of the kit. (4) Collagen type 1 α 2 Chain (Col1 α 2) and osteocalcin (OCN), two osteogenic markers, were measured through western blot, with glyceraldehyde 3-phosphate dehydrogenase (GAPDH) as an endogenous control. (5) Phospho-phosphoinositide 3-kinase (pPI3K), phospho-protein kinase B (pAkt), and runt-related transcription

factor 2 (Runx2) was tested through western blot as well. GAPDH or protein kinase (Akt) was chosen as an internal reference as appropriate. (6) Analysis of variance with the least significant difference was used to analyze the data. A $P < 0.05$ was considered statistically significant.

Results: (1) The higher concentration of T315 related to the less relative mineralized area and the positive area of ALP, while longer incubation time with T315 decreased these regions as well (Figure 1A-C). (2) T315 reduced the activity of ALP accordingly (Figure 1D). (3) T315 suppressed the protein expression of Col1 α 2 and OCN in a dose-dependent and time-dependent manner (Figure 1E, F). (4) T315 did not alter pPI3K, but it inhibited the phosphorylation of Akt (Figure 1G, H). (5) Runx2 was reduced because of the greater dose or longer incubation time with T315 (Figure 1).

Conclusion: T315 inhibits the differentiation of osteoblasts through inhibiting the phosphorylation of Akt. Surprisingly, pPI3K seldom changes in this process, so its detail mechanism should be investigated in further.

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Figure 1. Effect of T315 on Saos-2 cells and PI3K/Akt pathway. (A) Alizarin red stain and ALP stain at d21. (B) Relative mineralized area in Alizarin red stain. (C) Positive area in ALP stain. (D) ALP activity. Western blot analysis and its bands at d6 for Col1 α 2 (E), OCN (F), pPI3K (G), pAkt (H), and Runx2 (I). Results were normalized by GAPDH or Akt. ALP: Alkaline phosphatase; Col1 α 2: Collagen type 1 α 2 Chain; GAPDH: Glyceraldehyde 3-phosphate dehydrogenase; OCN: Osteocalcin; pPI3K: Phospho-phosphoinositide 3-kinase; pAkt: Phospho-protein kinase B; Akt: Protein kinase; Runx2: Runt-related transcription factor 2. * Compared with d0 in the same concentration of T315, $P < 0.05$. ** Compared with 1 μ g/ml T315 in the same incubation time, $P < 0.05$. *** Compared with 2 μ g/ml T315 in the same incubation time, $P < 0.05$.

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POS0045 LEAST SIGNIFICANT CHANGE IN BONE DENSITOMETRY IN PATIENTS WITH OBESITY

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Background: Dual energy X-ray absorptiometry is the reference method to measure bone mineral density (1). Loss of bone mineral density is significant if it exceeds the least significant change. The threshold value used in general population is 0.03 g/cm² (2). Patients with obesity are known for having a higher bone mineral density due to metabolism and physiopathology characteristics (3,4).

Objectives: The aim of our study was to determine the least significant change in bone densitometry in patients with obesity.

Methods: We conducted an interventional study in 120 patients with obesity who performed a bone densitometry. We measured twice the bone mineral density at the lumbar spine, the femoral neck and the total hip in the same time (5,6). We determined the least significant change in bone densitometry from each pair of measurements, using the Bland and Altman method. We also determined the least significant change in bone densitometry according to each stage of obesity.

Results: The least significant change in bone densitometry in patients with obesity is 0.046 g/cm² at the lumbar spine, 0.069 g/cm² at the femoral neck and 0.06 g/cm² at the total hip.