SAT0664

CARTILAGE DAMAGE QUANTITATIVELY ASSESSED BY MRI USING T2 MAPPING IN CCP-POSITIVE RA PATIENTS

N. Renner¹, A. Kleyer², G. Krönke², D. Simon², J. Rech³, G. Schett², G. Welsch⁴, M.L. Pachowsky¹. ¹Trauma and Orthopaedic Surgery; ²Department of Internal Medicine 3, Rheumatology and Immunology; ³Department of Internal Medicine 3, Rheumatology and Immunology, Friedrich-Alexander-University Erlangen-Nürnberg (FAU) and Universitätsklinikum Erlangen, Erlangen; ⁴UKE Athleticum, University Hospital Hamburg-Eppendorf, Hamburg, Germany

Background: T2 mapping is a non-invasive quantitative MRI approach which reflects cartilage hydration and collagen integrity without using contrast enhancement. It is a sensitive tool to determine cartilage damage and is currently spreading into broader clinical application.¹

Objectives: This study aimed to analyse biochemical changes in cartilage of Metacarpophalangeal (MCP) joints in patients with rheumatoid arthritis (RA) using T2 mapping in a 3 T MRI setting.

Methods: Thirty RA patients fulfilling the 2010 ACR/EULAR criteria were recruited. Image acquisition was performed using two surface coils in a 3 T MRI whole body scanner (VERIO; SIEMENS Healthcare).² We obtained high-resolution images of the 2nd and 3rd MCP joint. T2 maps were calculated using a pixel-wise, mono-exponential, non-negative least-squares-fit analysis. Region-of-interest (ROI) analysis was performed by dividing the cartilage into medial, central and lateral phalangeal (med, cent, lat P) and metacarpal (MC) area. ACPA positive patients were compared to ACPA negative patients. Statistical evaluation was performed by means of univariate ANOVA testing with random factors. A p-value<0.05 was considered statistically significant. The study protocol was approved by the local ethics commission. Written informed consent was obtained from all patients

Results: Fourteen ACPA positive (3 male/11 female) and 16 ACPA negative patients (6 male/10 female) were included. Mean age, sex distribution and disease duration were comparable (age: 49.0±15.1 years (ACPA+) vs. 56.1±10.9 years (ACPA-), t=1.494, p=0.146; sex distribution: χ^2 (1)=0.918, p=0.338, disease duration: 7.9±7.3 years (ACPA+) vs. 3.9±3.8 years (ACPA-), U=69.0, Z=-1.799, p=0.072).

T2 values were significantly higher in the majority of the ROIs in ACPA-positive (+) RA patients compared to ACPA negative (-) patients with a statistical significance in five of the six ROIs.

T2 values in ms: MC med (+) 41.3±15.3 vs. (-) 29.6±7.4 p=0.010, cent (+) 43.8±14.6 vs. (-) 28.4±10.9, p=0.001, lat (+) 45.6±13.8 vs. (-) 32.0±8.6, p=0.008. P: med (+) 30.3±14.6 vs. (-) 25.7±14.0, p=0.169, cent (+) 29.9±13.0 vs. (-) 22.5±10.1, p=0.014, lat (+) 37.0±15.9 vs. (-) 28.8±12.6, p=0.039.

Conclusions: T2 mapping is a clinically feasible non-invasive MR tool for cartilage evaluation of RA patients' MC joints. ACPA positive RA patients showed significantly increased T2 values compared to ACPA negative patients reflecting a more severe cartilage alteration despite comparable disease duration.

REFERENCES:

- Welsch GH, Apprich S, Zbyn S, Mamisch TC, Mlynarik V, Scheffler K, Bieri O, Trattnig S: Biochemical (T2, T2* and magnetisation transfer ratio) MRI of knee cartilage: feasibility at ultra-high field (7T) compared with high field (3T) strength. *European radiology* 2011;21(6):1136–1143.
- Renner N, Kronke G, Rech J, Uder M, Janka R, Lauer L, Paul D, Herz B, Schlechtweg P, Hennig FF, et al. Anti-citrullinated protein antibody positivity correlates with cartilage damage and proteoglycan levels in patients with rheumatoid arthritis in the hand joints. *Arthritis & rheumatology* (Hoboken, NJ) 2014;66(12):3283–3288.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.2849

SAT0665

SYNOVITIS AS A PREDICTOR OF EROSIONS IN THE HAND OSTEOARTHRITIS

O. Balueva¹, A. Sarapulova², O. Teplyakova². ¹Ultrasound Diagnosis, Medical Association "New hospital"; ²Urals state Medical University, Yekaterinburg, Russian Federation

Background: The formation of bone erosions in hand osteoarthritis (HOA) is the result of the association of destructive and inflammatory changes in the joint and leads to a more aggressive course of the disease. X-ray examination assesses destructive bone changes, but there is no possibility to assess the condition of periarthral tissues and inflammatory changes objectively. Visualisation of both

erosions and synovitis is possible during ultrasound examination of the hands. On the basis of this results it is possible to predict the further development of the disease.

Objectives: To determine the risk of erosion appearance and the features of progression in patients with hand osteoarthritis in a prospective study.

Methods: The study included 45 women which were 45–75 years old with the diagnosis of HOA, defined by criteria of the American College of Rheumatologists (ACR). 22 joints were examined at each patient by ultrasound: distal interphalangeal joints (DIP), proximal interphalangeal joints (PIP), joints of the thumb and 1 st carpo-metacarpal joint (1 st CMC). Ultrasound examination included multiplane gray-scale investigation of the listed above groups of joints. The presence and severity of synovial hypertrophy and effusion followed by evaluation of the degree of synovitis was determined in the B-mode; the quantity and the sizes of osteophytes and bone erosions were evaluated in a similar way. The vascularisation of synovial hypertrophy was estimated in the power Doppler ultrasound. The study was started in 2013. In 3 years the study was repeated. The results were processed with STATISTICA 10.0 software (StatSoft Inc. USA) using the methods of nonparametric statistics. For the description of communication of qualitative signs we used coefficient "odds ratio" OR and χ^2 . The results were recognised statistically reliable at value p < 0.05.

Results: The total number of hand joints was evaluated using ultrasound 990. In the primary examination 391 joints had synovitis, 46 joints had synovitis and erosion. In 3 years the number of joints with synovitis and the number of joints with synovitis and erosion increased up to 443 and 73 respectively. In 2016 among 73 joints with synovitis and erosion, 40 joints were with erosion against the background of synovitis 3 years ago, and only in the 8 joints erosion were revealed where was no synovitis. Thus the frequency of erosion detection in hand joints at repeated examination was higher in the cases the synovitis was detected at primary examination: χ^2 2=16.38 p=0.0001; OR 4.373, CI 95% 2.01–9.47.

Conclusions: The synovitis in hand joints is a prognostic adverse factor of erosions appearance and transformation in the erosive subtype of osteoarthritis. The possibility one-time visualisation of inflammatory and destructive changes allows using ultrasound investigation at primary and differential diagnostics, and dynamic evaluation.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.1702

SAT0666

INFLAMMATION BEYOND CLINICAL REMISSION: ULTRASOUND AS A TOOL TO GUIDE US TO REMISSION

P. Estrada¹, C. Diaz-Tomé², V. Torrente³, P. Moya², C. Moragues⁴, D. De La Fuente⁵, S. Ros⁵, J. Ramirez⁶, M. Moreno⁷, E. García⁸, M. Puyol⁹, N. Busquets¹⁰, A. Ponce¹⁰, J. De Agustín¹¹ on behalf of Ecocat on behalf of ECOCAT. ¹Hospital Moisès Broggi-CSI; ²Hospital de la Santa Creu i Sant Pau; ³Hospital General de L'Hospitalet; ⁴Hospital Plató; ⁵Hospital Viladecans; ⁶Hospital Clínic; ⁷Hospital Parc Taulí; ⁸Hospital Mollet; ⁹Mútua de Terrassa; ¹⁰Hospital Granollers; ¹¹Hospital de la Vall d'Hebron, Barcelona, Spain

Background: Among patients with RA in remission, subclinical synovitis (SS) has a prevalence of 45% and is associated with an increased risk of clinical relapse and progression to structural damage. US is a sensitive and accessible tool for evaluating SS^{1,2,3}.

Objectives: To analyse US as a tool for evaluating SS in RA patients treated with tocilizumab (TCZ), in order to assess remission, and from there on propose therapeutic tapering.

Methods: Multicenter, 1 year follow up study in 45 patients with RA treated with TCZ. The project was approved by Ethics Committees and all the patients gave their informed consent. At each visit: DAS28, SDAI, CDAI, mHAQ, US grey scale (GS) and Power Doppler (PD) parameters for 32 joints (J) and 28 tendons (T), with a semiquantitative scale from 0–3 points. A quantitative index was obtained for J and T in GS and PD and overall (EG +PD) for each patient/visit. SS was considered as the presence of synovitis with PD(+)≥2. Our intra and interobserver kappa index was 0.8.

Results: A significant reduction of all clinical indexes and US variables was observed in all patients. Patients were divided into two groups: remission (R) and no remission (NR) according to whether they achieved DAS28 ≤2.6 at 12 months. Group R achieved DAS28 ≤2.6 after mo 3, whereas US showed SS (GS+, PD >2) until mo 12. The final overall PD value in the R group was 0.6 (±0.9).