p=0.014) and increased tenosynovial volume (B=7.39, 95% CI 0.41~14.38, p=0.039) (Table).

Table 1 Univariate and multivariate analysis for factors associated with synovial volume and tenosynovitis volume at baseline in all ERA patients

Table Univariate and multivariate analysis for factors associated with synovial volume and tenosynovitis volume at baseline in all ERA patients

Synovial volume	Univariate			Multivariate		
	B	95%CI	P value	B	95%CI	P value
Age	0.79	0.09-1.50	0.026			
Sex	0.23	-0.043-0.51	0.098			
Dj	6.58	1.53-11.64	0.011			
DAS28-CRP	14.22	5.25-23.18	0.002			
miR-99b-5p	16.15	2.98-29.32	0.018	15.65	3.42-27.89	0.014

Dj: damage joint count; DAS 28: Disease Activity Score 28

Tenosynovial volume	Univariate			Multivariate		
	B	95%CI	P value	B	95%CI	P value
Age	0.51	0.10-0.92	0.016			
Sex	0.47	-0.07-0.94	0.054			
Tj	1.07	0.044-2.10	0.042			
DAS28-CRP	5.86	0.42-11.30	0.035			
miR-99b-5p	7.36	-10.05-13.71	0.025	7.39	0.41-14.38	0.039

Tj: Tender joint count; DAS 28: Disease Activity Score 28

Conclusions: Increased cell-free circulating miR-99b-5p is associated with increased synovial and tenosynovial volume as well as more severe bone erosion in ERA patients at presentation. Whether it may serve as a biomarker for monitoring the progression of synovitis and damage would need to be addressed in prospective studies.

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SAT0657 MICROWAVE RADIOMETRY-DERIVED THERMAL CHANGES OF SACROILIAC JOINTS AS A BIOMARKER OF SACROILIITIS IN PATIENTS WITH SPONDYLOARTHROPATHY

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Background: Microwave Radiometry (MR) is a rapid, easy-to-perform, non-invasive method that detects in-depth tissue temperatures. In a proof-of-concept study we found that an increased knee joint temperature detected by MR reflects the presence of subclinical synovial inflammation in patients with rheumatoid arthritis.¹

Objectives: To test the hypothesis that MR-derived increased temperature of sacroiliac (SI) joints is a biomarker of local inflammation in patients with axial spondyloarthritis (SpA) in a cross-sectional study.

Methods: Sixty patients with SpA (32 with ankylosing spondylitis, 24 with psoriatic arthritis, 4 with enteropathic arthritis) underwent clinical and laboratory assessments, magnetic resonance, X-ray imaging, and MR measurements of SI joints. All MR measurements were performed by a physician who was blinded to the clinical evaluations. Patients were classified as having active sacroiliitis (pain and/or tenderness and/or bone marrow oedema on magnetic resonance, n=23), inactive sacroiliitis (n=19), whereas signs/symptoms of a present/past SI joint involvement were absent in the remaining 18 patients. Twenty five age-matched healthy individuals served as controls. Three MR measurements were performed along each SI joint and a number was calculated for each patient denoting the difference (ΔT) in temperature between the warmest point in either SI joint and a control point, which was the iliac bone.

Results: A lower ΔT , indicative of a warmer joint, was found in patients with either active or inactive sacroiliitis compared to patients without sacroiliitis [mean (SD) ΔT of 0.1 (0.5) vs. 0.6 (0.5), respectively, p=0.001] or healthy controls [mean (SD)

ΔT of 0.60 (0.55), p=0.003]. A warmer SI joint was not significantly associated with the presence of local tenderness or pain, the patient visualised analogue pain scale for SI joints, the BASDAI score, the New York radiological grading of SI lesions, or C-reactive protein levels. Notably, all 20 patients with increased SI joint temperature ($\Delta T < 0.05$, which was the mean ΔT value minus one SD in healthy controls) had either symptoms/signs of sacroiliitis or imaging confirmed sacroiliitis even in the absence of clinical findings. Receiver operating analysis showed that a ΔT cut-off of 0.35 could discriminate with a sensitivity of 78% and specificity of 74% patients with sacroiliitis from those without, or from healthy controls (both p=0.001); sensitivity reached 100% for ΔT values equal or lower than 0.05.

Conclusions: MR-derived increased in-depth temperature indicative of local inflammation of SI joints may serve as an additional diagnostic marker in axial SpA

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SAT0658 QUANTITATIVE ANALYSIS OF JOINT STRUCTURE BY HR-pQCT IN PATIENTS WITH RHEUMATOID ARTHRITIS: CORRELATION BETWEEN CARTILAGE LOSS AND BONE DETERIORATION

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Background: HR-pQCT is a high-resolution CT dedicated to human extremities. It has been used for the study of rheumatoid arthritis (RA) in recent years, enabling quantitative analysis of bone erosion, bone microstructure, and joint space.

Objectives: The purpose of this study is to investigate a correlation between cartilage loss and bone deterioration (juxta-articular osteoporosis and erosion) in patients with RA by HR-pQCT.

Methods: Twenty patients with RA (70±8 years, 15 female, 5 male) participated in this study. The second and third MCP joints were scanned by second-generation HR-pQCT (XtremeCT II, Scanco Medical, Switzerland) at the voxel size of 61 μ m.

The following parameters were measured semiautomatically using dedicated software (TRI/3D-BON, Ratoc System Engineering, Tokyo) based on previous studies¹⁻³. 1) Average joint space width (ave-JSW) of MCP joints, 2) bone microstructure of metacarpal head: volumetric bone mineral density (vBMD), trabecular thickness (Tb.Th), trabecular number (Tb.N), and structure model index (SMI), 3) total volume of erosions (ER-volume) on the metacarpal head.

Results: Ave-JSW of MCP joints was 1.47 (1.00-1.89) mm. vBMD of the metacarpal head was 131.4 (54.3-263.5) mg/cm³, Tb.Th was 213.1 (166-329.3) μ m, Tb.N was 0.95 (0.69-1.50)/mm, and SMI was 1.68 (0.65-2.52). The total number of erosions was 31, and an average number of erosions on each metacarpal head was 0.9 (0-4). Total ER-volume on the metacarpal head was 1.96 (0-16.7) mm³. Ave-JSW had significant correlations with vBMD, SMI and ER-volume (R=0.37, -0.40, -0.42, p<0.05).

Conclusions: Cartilage loss was correlated with juxta-articular osteoporosis and bone erosion in RA patients. Quantitative evaluation of total joint structure (joint space, bone microstructure, and erosion) by HR-pQCT would be useful for the pathophysiological research and drug development of RA.

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SAT0659

IS SYNOVIAL HYPERTROPHY WITHOUT DOPPLER ACTIVITY IN RHEUMATOID ARTHRITIS JOINTS SENSITIVE TO CHANGE? – RESULTS OF A LONGITUDINAL ULTRASOUND STUDY

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Background: Ultrasound (US) is used to assess disease activity in rheumatoid arthritis (RA). Grey scale (GS) US shows the synovial hypertrophy (SH) and Doppler the amount of hyperemia which is believed to reflect disease activity. Some joints with SH may have no Doppler activity despite the use of high-end US equipment and these joints are generally believed to be inactive without potential to change.

Objectives: The aim was to investigate if joints with SH but no Doppler activity is sensitive to change during treatment with biological DMARD (bDMARD) in RA patients.

Methods: RA patients initiating or changing bDMARD treatment were included. US examination was performed at baseline, 3 and 6 months using Siemens Antares US equipment with Doppler settings for slow flow.

36 joints were evaluated at each visit. SH and Doppler activity was graded from 0–3 according to the US atlas by Hammer et al.⁽¹⁾ The GS score for SH in joints without Doppler activity was registered for the individual joints using GS SH ≥ 1 as threshold. The changes were compared to changes in SH in joints with Doppler activity.

Results: 151 patients (82.8% women, 80.1% seropositive for anti-CCP) were included, with a mean (SD) age 51.4 (13.2) years, disease duration 9.9 (7.9) years. At baseline, 50.7% used prednisolone (mean (SD) 5 mg (4.68)).

The patients had a mean (SD) baseline DAS28 of 4.5 (1.5). At baseline 23% of the joints had SH without Doppler activity and 23% of the joints had SH with Doppler activity.

Doppler-negative joints had overall lower grades of SH (mean 1.2) than Doppler-positive joints (mean 2.2) at baseline using GS SH > 1 as cut-off. The improvement in SH was similar in Doppler-positive and Doppler-negative joints but when adjusting for the baseline score of SH, Doppler-negative joints had a higher tendency towards decrease than Doppler-positive joints for all grades (3 months: $p < 0.0001$; 6 months: $p = 0.0006$).

A weak correlation was found to changes in DAS 28(crp) (Doppler-negative joints: 0.27 ($p = 0.001$) and 0.18 ($p = 0.03$) at 3 and 6 months respectively – Doppler-positive joints: 0.25 ($p = 0.004$) and 0.33 ($p = 0.0002$) at 3 and 6 months respectively).

Conclusions: SH in joints without Doppler activity improves during bDMARD, i.e. is sensitive to change. Thus, SH without Doppler activity is not a sign of inactive disease. These findings document that both Doppler and SH should be evaluated when assessing disease activity by US.

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SAT0660

CLINICAL SIGNIFICANCE OF ANTI-RA33 AUTOANTIBODIES IN RHEUMATOID ARTHRITIS

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Background: Recently heterogeneous nuclear ribonucleoproteins (hnRNPs) were identified as antigenic targets for autoantibodies in RA. Autoantibodies to RNP B1, B2 and heterogeneous complex A2/b are the most studied and are referred to as "antigen RA33". Clinical value of anti-RA33 in RA continues to be studied, so the question is about the diagnostic and pathogenetic significance of these autoantibodies in patients with RA remains open.

Objectives: The aim of this study was to investigate the frequency of occurrence of anti – RA33y patients with RA and compare them with clinical manifestations and immunological parameters of disease.

Methods: The study included 139 patients with RA. The diagnosis was verified according to the classification criteria of ACR/^{EULAR 2010}. Autoantibodies to RNP B1 IgG was assessed in samples of blood serum by enzyme immunoassay (ELISA; Medipan AG, Germany). Anti-CCP, RF and antibodies to Sa-antigen (anti-Sa) was evaluated by ELISA according to the manufacturer's instructions (Euroimmun AG company, Germany). The results were expressed in relative units (U/ml). Statistical data processing was carried out using the software Statistica 7.0 (StatSoft, USA) and Medcalc 12.5.0.0 (USA), including standard methods of parametric and nonparametric analysis. Differences were considered significant at $p < 0.05$.

Results: In our cohort of patients with RA, the incidence rate of RF IgM was 96.02%, anti-CCP – 81.75%, anti-Sa – 69.88%, anti-RA33%–35.97% of patients. For further analysis of the clinical significance of anti-RA33 patients were divided into 2 groups: anti-RA33 positive and anti-RA33negative.

Positive and negative for anti-RA33 patients did not differ ($p > 0.05$) by key characteristics, such as age, gender, duration of disease, and indicators of disease activity (CRP levels, DAS28, SDAI, CDAI). In contrast to the data obtained Maslyansky A. L. and co-authors the correlation relationship between the levels of anti-RA33 and indicators of disease activity as well as duration of disease has not been established. At the same time seronegative for anti-RA33 patients demonstrated a higher frequency of extraarticular manifestations ($p < 0.05$).

When analysing the frequency of occurrence of anti-CCP, RF IgM, anti-Sa and anti-RA33 autoantibodies, there were no differences between the groups of seropositive and seronegative for anti-RA33. Correlation relationship between the levels of the investigated autoantibodies is not established.

Conclusions: Thus anti-RA33 is a perspective independent biomarker of RA, which has its own potential. The possible pathogenic significance of anti-RA33 as a biomarker of a more favourable course of the RA should be considered.

To clarify the diagnostic and pathogenic value of anti-RA33 further research with a large sample size, comparison of immunological data with genetic factors, the results of other laboratory and instrumental studies, clinical manifestations of the disease are required. The obtained data will allow us to more thoroughly study the pathogenesis of RA and contribute to the search for new therapeutic options.

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SAT0661

MEASUREMENT OF THE INTIMA MEDIA THICKNESS OF TEMPORAL AND AXILLARY ARTERIES IN SUBJECTS WITH DIFFERENT RISKS OF CARDIOVASCULAR DISEASE: AN ULTRASOUND STUDY

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Background: The "halo sign" is considered the well known qualitative ultrasound (US) finding for the diagnosis of giant cell arteritis (GCA). Recently, the measurement of the intima-media thickness (IMT) of temporal and axillary arteries has been proposed as a potential complementary US biomarker. A cut-off for IMT of 0.42, 0.29, 0.34 and 1.0 mm for superficial temporal arteries, parietal and frontal branches and axillary arteries, respectively, has been suggested. In fact, other conditions, such as atherosclerosis, may determine an increase of the IMT.

Objectives: To measure the IMT of the temporal and axillary arteries in subjects with different risks of cardiovascular (CV) disease and to investigate the prevalence of IMT values greater than the reference cut-off values.

Methods: Consecutive patients older than 50 years without signs or symptoms and without a previous history of GCA or polymyalgia rheumatica, were included. The European Guidelines of CV disease prevention were used to define different categories of CV risk. The subjects were divided in two groups: a first group made up of subjects with very high or high risk of CV disease and a second group made up of subjects with moderate or low risk of CV disease. The US examination was performed with a My Lab Twice (Esaote S.p.A. Genoa, Italy). The temporal arteries (superficial temporal arteries, parietal and frontal branches) were evaluated using a 18–22 MHz probe, whereas the axillary arteries were studied using a 6–18 MHz probe.

Results: Eight hundred and eight arteries were evaluated in 101 subjects (mean age 66.1 SD 8.5, 73.3% females). Thirty-one subjects (30.7%) were classified with very high risk of CV disease, 7 (6.9%) with high risk, 34 (33.7%) with moderate risk and 29 (28.7%) with low risk. The IMT of the superficial temporal and axillary arteries were significantly higher in the group made up of subjects with very high or high risk of CV disease than in the group made up of subjects with moderate or low risk of CV disease (0.21 SD 0.82 vs 0.19 SD 0.86 $p < 0.013$; 0.54 SD 0.17 vs 0.48 SD 0.10 $p < 0.20$). The value of the IMT was higher than the reference cut-off in 13 out of 808 (1.61%) of the studied arteries (2 superficial temporal artery, 6 parietal branch, 4 frontal branch and 1 axillary artery), in at least one artery in 10 out of 101 patients (10.1%). Of these 10 patients, 8 (98%) were classified as having very high or high risk of CV disease.