Results: Inter-reader reliability was overall moderate for joint scores and poor for enthesis scores; however, among the 3 musculoskeletal radiologists, enthesis scores were as reliable as joint scores (Table). Reliability did not improve between the first and second round, possibly because patients with several very conspicuous inflammatory lesions were selected as cases in the first round.

Abstract SAT0671 – Table 1. Inter-reader reliability of scoring inflammation of peripheral joints and entheses (Cohen's kappa with squared weights for individual scores, ICC(3,1), agreement, for sum scores). All values are median (IQR; range) of all reader pairs (36 reader pairs for 9 readers, 91 reader pairs for 14 readers, 3 reader pairs for 3 readers [values for 3 reader pairs provided]).

	Kappa for osteitis scores (joints)	Kappa for synovitis scores (joints)	Kappa for osteitis scores (entheses)	Kappa for soft tissue inflamm. (entheses)	Kappa for all sites combined	ICC
First round (9 readers)	0.86 (0.81-0.90; 0.67-0.98)	0.63 (0.43-0.84; 0.26-0.94)	0.51 (0.27-0.63; 0.03-0.84)	0.36 (0.17-0.74; -0.08-0.92)	0.67 (0.62-0.75; 0.47-0.90)	0.64 (0.28-0.89; -0.26-1.00)
Second round (9 readers that had participated in first round)	0.61 (0.52-0.67; 0.36-0.80)	0.66 (0.61-0.70; 0.53-0.82)	0.33 (0.26-0.42; 0.02-0.69)	0.21 (0.12-0.31; -0.01-0.62)	0.53 (0.50-0.58; 0.42-0.70)	0.68 (0.60-0.82; 0.47-0.99)
Second round (all 14 readers)	0.48 (0.36-0.60; 0.10-0.80)	0.57 (0.45-0.66; 0.24-0.82)	0.32 (0.18-0.44; -0.06-0.80)	0.22 (0.12-0.35; -0.06-0.62)	0.47 (0.40-0.54; 0.25-0.72)	0.60 (0.30-0.75; -0.02-0.99)
Second round (3 musculoskeletal radiologists)	0.50 / 0.32 / 0.26	0.68 / 0.58 / 0.54	0.53 / 0.67 / 0.68	0.51 / 0.58 / 0.45	0.57 / 0.54 / 0.49	0.70 / 0.52 / 0.23

Conclusions: It is feasible to perform online multi-reader scoring exercises of whole-body MRI using a web-based scoring interface. MRI readers need to be further trained and calibrated in the semiquantitative scoring approach used to increase inter-reader reliability.

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SAT0672 IS ULTRASOUND REMISSION ACHIEVABLE IN PATIENTS WITH EARLY RHEUMATOID ARTHRITIS?

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Background: In rheumatoid arthritis (RA) the "window of opportunity" has a crucial role for better long-term outcomes.¹ The ACR/EULAR remission criteria for RA are mostly represented by clinical parameters, while ultrasound (US) is not included.² However, in early diagnosed and early treated patients, who fulfil the remission criteria, residual US modifications can be identified.³

Objectives: The aim of this study was to investigate whether significant US-detectable differences between early RA (ERA) patients treated for one year and healthy controls (HC) are present.

Methods: We enrolled in this cross-sectional study consecutive patients with ERA at 1 year after having initiated RA disease-modifying (DMARD) therapy and who had received treatment following RA recommendations. Only patients who had fulfilled EULAR/ACR 2010 criteria for RA⁴ and with symptoms duration of less than 1 year at treatment initiation were included. US exams were performed in 10 joints bilaterally (wrist, MCP II-V) by using both gray-scale and Doppler for evaluating synovitis was graded according to a semi-quantitative 4-point scale (0–3). A total US score for synovitis was calculated by adding the values recorded at each joint site. The presence of erosions was also recorded. Finally, US results obtained in patients were compared to those detected in HC.

Results: 84 subjects were enrolled – 45 ERA patients and 39 HC. In ERA patients the mean duration of symptoms prior to diagnosis was 3.5±3.5 months. The demographic, clinical and US data are reported in table 1.

Abstract SAT0672 – Table 1. Demographic, clinical and US data for ERA patients and HC [n (%), mean±SD or median (IQR)]

Parameters	ERA (n=45)	HC (n=39)	p
Gender (Female)	28 (62.2%)	25 (64.1%)	0.859
Age	56.16±19.91	46.59 ±12.93	0.003
VAS pain	19 (10.25–30)	0 (0–2)	<0.001
US score	4 (1.5–6.5)	1 (0–3)	<0.001
Erosions	23 (51.11%)	0 (0%)	<0.001

As expected, the values of visual analogue scale (VAS) for pain and of the total US score and the incidence of erosions were significantly higher in ERA patients than in HC. The values of the US score correlated with the presence of erosions ($r_s=0.427$, $p<0.001$) as well as with the values of acute phase reactants (CRP: $r_s=0.539$, $p=0.412$ and ESR: $r_s=0.412$, $p=0.005$). VAS of disease activity reported by patients ($r_s=0.473$, $p<0.001$) and physician ($r_s=0.412$, $p<0.001$).

Conclusions: Patients with RA, who had been early diagnosed and early treated, after 1 year of tight control had still US inflammatory and erosive changes compared to HC. US assessment gives an added value to clinical evaluation in ERA, for its capacity to detect residual inflammatory abnormalities, even under optimised treatment and consequent structural lesions.

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SAT0673 MAGNETIC RESONANCE IMAGING IN THE DIAGNOSIS OF AXIAL SPONDYLOARTHRITIS: A SYSTEMATIC LITERATURE REVIEW

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Background: Magnetic resonance imaging (MRI) is an essential tool in the diagnosis and management of axial spondyloarthritis (axSpA). However, a recent survey showed variable practices in the use of MRI across the UK.¹ To inform a joint rheumatology and radiology consensus exercise aimed at standardising practice, we systematically reviewed the literature regarding the use of MRI in the diagnosis of axSpA.

Objectives: We aimed to answer three research questions:

1. How does the choice of anatomical region influence diagnostic performance?
2. How do MRI acquisition parameters influence diagnostic performance?
3. Which lesion, or combination of lesions, is most sensitive and specific for the diagnosis of axSpA?

Methods: MEDLINE (via Pubmed) and EMBASE (via Ovid) databases were searched using previously-reported terms.² These terms identified studies including adult patients with clinically suspected axSpA undergoing MRI, where a diagnosis of axSpA was used as an outcome and where patients with a negative test for SpA were used as controls. We included studies performed between January 2013 and March 2017, in addition to those included in a previous systematic literature review, which included all studies up to January 2013.² Search results were screened by title and abstract, and the included studies were subject to detailed review and quality assessment using the QUADAS-2 tool.³

Results: The combined search resulted in a total of 8114 studies; 34 of these were finally selected for inclusion.

Five studies evaluated the added value of spinal MRI over SIJ MRI alone, with variable results depending on the cohort.

Three studies addressed the effect of sequence choice on diagnostic accuracy, demonstrating comparable utility of fat-saturated T2-weighted (T2w) sequences and STIR imaging, and suggesting T2w Dixon imaging as a potential alternative

method for fat suppression. Three studies investigated the role of gadolinium in the SIJs, and overall found minimal added value. Bone marrow oedema of the sacroiliac joint (SIJ) was found to be the most sensitive and specific lesion in the diagnosis of axSpA in seven studies. Sensitivity and specificity were increased by including other structural lesions, particularly bone marrow fat or erosions. Four studies addressed the utility of SIJ fat infiltration, demonstrating good sensitivity but relatively poor specificity. A number of studies addressing erosions, high T1 signal in the SIJ, fluid signal in the SIJ, ankylosis, sclerosis, capsulitis, backfill and vacuum phenomenon reported low to moderate diagnostic performance for these features. In the spine, four studies reported moderate sensitivity and specificity for corner inflammatory lesions, and four reported poor sensitivity and specificity for spinal fatty lesions. Three studies evaluated agreement between observers for inflammatory and structural features. Agreement was best for the presence of oedema in the SIJs, but was poor for structural features. Agreement was weak to moderate for global diagnosis.

Conclusions: These results have informed the recommendations of a consensus group aiming to standardise practice around the use of MRI scans in the UK.

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SAT0674 THE USE OF QUANTITATIVE MUSCLE ULTRASOUND AS A FOLLOW-UP TOOL IN INFLAMMATORY MYOSITIS AND DUCHENNE MUSCULAR DYSTROPHY IN CHILDREN

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Background: Ultrasound (US) can provide a painless and noninvasive tool for evaluation and follow up of muscle diseases especially in young children who may have restrictions in execution of muscle strength tests and functional scales.

Objectives: This study aimed to assess skeletal muscle structural status in children with Juvenile dermatomyositis (JDM) and Duchenne muscular dystrophy (DMD) using quantitative muscle US and to perform a longitudinal follow up of these changes over time and correlate these findings with clinical parameters, functional scales, biochemical and electromyographic tests.

Methods: This is a longitudinal study conducted on 35 subjects: 20 JDM patients and 15 DMD patients at baseline and after 12 months of follow-up. In all patients, Quantitative MSUS measurements was performed to the biceps brachii muscle (BB), the forearm flexors (FF), the rectus femoris muscle (RF), the tibialis anterior muscle (TA) according to a standard protocol.¹ The captured images were analysed offline for muscle thickness and echo intensity (EI) by means of computer-assisted grayscale histogram analysis. Manual muscle testing (MMT) was assessed and serum creatine kinase (CK) levels were measured. Also, Quantitative electromyography (QEMG) assessment was performed as BB and RF were studied on the most affected side with emphasis on motor unit potential (MUP) duration, area to amplitude ratio (AAR).

Results: In JDM patients, EI of the proximal muscles (BB and RF) at 12 months follow up (75.32±29.84 and 74.73±25.58 respectively) were highly significantly decreased compared to their baseline EI (127.18±50.62 and 100.68±33.65 respectively) (p<0.05). Also, EI of BB and RF at 12 months follow up showed statistically significant correlation with their MMT (r=-0.51, p<0.05), CK levels (r=0.42, p<0.05) and MUP duration (p<0.05). In DMD patients, EI of BB, RF and TA muscles at 12 months follow up (122.3±41.29, 132.55±41.38 and 136.75±38.02 respectively) were significantly increased compared to their baseline EI (116.7±42.65, 124±43.33 and 133.3±39.57 respectively, p<0.05). Also, EI of BB, RF and TA at 12 months follow up showed statistically significant correlation with their MMT (r=-0.67, -0.68 and -0.68 respectively, p<0.05), CK levels (r=0.77, 0.76 and 0.7 respectively, p<0.05), MUP duration (r=-0.73, -0.58 and -0.53 respectively, p<0.05) and AAR ratio (r=-0.79, -0.81 and -0.62 respectively, p<0.05). Logistic regression analysis showed that baseline EI were predictive of follow up MMT score in both JDM and DMD patients (p=0.03 and 0.01 respectively).

Conclusions: Quantitative muscle US is a sensitive, objective technique for measuring the presence and severity of muscle pathology in both JDM and DMD patients. EI is remarkably correlated with MMT, muscle enzymes and quantitative EMG suggesting that it could be a useful follow up tool to reflect disease severity and residual muscle damage.

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SAT0675 SOLUBLE VASCULAR ADHESION MOLECULE-1 IS OVEREXPRESSED IN PATIENTS WITH VASCULITIS, RHEUMATOID ARTHRITIS AND ANKYLOSING SPONDYLITIS

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Background: Markers in rheumatology are in great demand in order to objectively diagnose the presence and activity of disease. CRP or ESR frequently are normal in many conditions. Vascular cell adhesion molecules mediate transendothelial migration. Several soluble isoforms can be measured in serum as marker for endothelial activation, for example in synovitis or vasculitis. We have recently shown that soluble vascular cell adhesion molecule-1 (sVCAM-1) is elevated in patients with positive antinuclear antibodies.¹

Objectives: The objective of this study was to analyse sVCAM-1 in a set of several rheumatic diseases and compare them to age- and gender-matched healthy controls.

Methods: Cross sectional study with 223 patients with rheumatoid arthritis (RA), ankylosing spondylitis (AS), psoriatic arthritis (PsA) and different vasculitides. Patients were treated with routine immunosuppressive agents, where indicated. CRP (mean mg/l±SD, normal <5), ESR (mean mm/h±SD), standard clinical disease activity scores (mean ±SD) and sVCAM-1 (ng/ml±SEM) in serum, determined by ELISA, was analysed.

Results: Patients with RA (n=136) had a DAS28 of 2.54±0.83, a close to normal CRP of 6.43±10.52, ESR of 16.9±12.6 and sVCAM-1 levels of 225.40±20.35 vs. 158.90±7.32 (p=0.0025). Patients with vasculitis (n=20) had a mean BVAS of 24.85±10.68, CRP was 5.86±7.77 mg/dl, ESR 14.5±11.5 and sVCAM-1 levels were also significantly different as compared to HC with 358.20±68.91 vs. 122.60±14.62 (p=0.0013). Patients with AS (n=33) had a mean BASDAI of 4.16±2.40, a CRP of 4.06±4.67, ESR 12.0±8.8 and had sVCAM-1 levels of 291.30±51.91 vs. 144.60±34.01 (p=0.021). Patients with PsA (n=34) did not show significant changes.

Conclusions: sVCAM-1 might be an objective disease marker in patients with RA, vasculitis and AS. It might be more reliable than standard CRP, especially in vasculitis. Prospective studies are needed to determine if sVCAM-1 is a predictive marker of disease activity and perhaps specific for biologic treatment regimens.

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SAT0676 ULTRASOUND DETECTED INFLAMMATION IN RHEUMATOID ARTHRITIS: ELUCIDATING THE RELATIONSHIP WITH CLINICAL MANIFESTATIONS AT THE WRIST

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Background: Tender and swollen joint counts are part of rheumatoid arthritis (RA) disease activity assessments. While subclinical synovitis is now a well-known entity, the relationship between tender and swollen joints and ultrasound (US) detected inflammation has not been well explored.

Objectives: To compare US detected inflammation (synovitis and/or tenosynovitis) with joint swelling and/or tenderness of the wrist, an important joint in RA. Tendons are included as tenosynovitis on US can be mistaken for joint involvement clinically.