p=0.021) exhibited higher diagnostic performance. Meta-regression after adjusting for country, year, and type of joint involved, showed that Grey Scale (GS) ≥ 1 RDOR 6.0 (95% CI 1.6, 22.5; p=0.009) and Power Doppler (PD) ≥ 1 RDOR 3.9 (95% CI 1.3, 11.7, p=0.018) had greater diagnostic accuracy when compared to higher cutoff values.

Conclusions: MSUS is a valuable diagnostic tool when used in patients with arthralgia and at risk for RA. GS ≥ 1 and PD ≥ 1 combined have better discriminative ability for diagnosing RA due to the overall specificity is greater than for either alone.

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FRI0008 **TISSUES ARE DIFFERENTLY MODULATED BY TOCILIZUMAB AND METHOTREXATE; ASSESSMENT OF CONNECTIVE TISSUE METABOLITES IN THE AMBITION STUDY**

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Background: Response to any treatment in rheumatoid arthritis (RA) is assessed by symptomatic changes, such as swollen joint count. Such assessments does not provide information regarding the effect of the treatment at tissue level. Chronic inflammation has a detrimental effect resulting in elevated levels of tissue remodelling and the release of extracellular matrix (ECM) metabolites into the circulation. The tissues consist mainly of interstitial matrix, basement membrane and cells, which are all affected by auto-immune disorders. Tissue metabolites can be measured in serum as biomarkers of tissue remodelling.

Objectives: The purpose was to investigate if tissue remodelling is differently modulated by tocilizumab (TCZ) and methotrexate (MTX).

Methods: The AMBITION study, a phase III RCT with tocilizumab vs. Methotrexate in which TCZ monotherapy (8 mg/kg every 4 weeks) was compared to methotrexate monotherapy over 24 weeks in patients with moderate-severe RA (AMBITION, NCT00109408). TCZ is a compound that inhibits the IL-6 receptor. Tissue metabolites were measured in baseline and 8 weeks sera (n=319) by ECM specific ELISAs: Connective tissue remodelling was measured by C3M (type III collagen degradation), basement membrane remodelling by C4M (type IV collagen), inflammation by C-reactive protein (CRP) and its metabolite CRPM. Comparison between groups were done by ANCOVA adjusting for age, gender, BMI and disease duration.

Results: Tissue remodelling was increased by 10% in the placebo group and significantly (p<0.001) inhibited by both MTX and TCZ compared to placebo. Inhibition with TCZ was 14% greater than that of MTX (p=0.0005). Basement membrane remodelling was likewise inhibited by both MTX and TCZ; the effect of TCZ was 20% greater than MTX (p<0.0001). MTX had limited effect on CRP and its metabolite CRPM compared to placebo or baseline. TCZ reduced the level to 27% and 73% of baseline, respectively. Although the effect of TCZ was much greater when assessing CRP, this was the least significant response marker, due to the huge placebo modulation, as well as the general high variation in response. Only changes in CRP was correlated to 8 week changes in DAS (rho=0.27, p=0.001) in the TCZ group. In the MTX group all changes in markers were correlated to change in DAS (rho=0.28 to 0.41, p<0.001). Only changes in C4M and CRP in the TCZ treatment arms were significantly correlated with DAS changes (rho=0.31, p<0.05).

Abstract FRI0008 – Table 1

Table	Mean change baseline (%)	8-week from 95%-CI	Lower 95%-CI	Upper 95%-CI	8 week change difference	P value
Connective tissue metabolite (C3M)						
PLACEBO	111	101	120	TCZ vs. PLACEBO	-37	<0.0001
MTX	88	83	94	MTX vs. PLACEBO	-22	0.0001
TCZ	74	69	79	TCZ vs. MTX	-14	0.0005
Basement membrane remodeling metabolite (C4M)						
PLACEBO	107	98	116	TCZ vs. PLACEBO	-40	<0.0001
MTX	87	82	93	MTX vs. PLACEBO	-20	0.0007
TCZ	67	62	72	TCZ vs. MTX	-21	<0.0001
C-reactive protein metabolite (CRPM)						
PLACEBO	112	91	133	TCZ vs. PLACEBO	-39	0.005
MTX	99	87	111	MTX vs. PLACEBO	-13	ns
TCZ	73	61	85	TCZ vs. MTX	-26	0.0091
C-reactive protein (CRP)						
PLACEBO	450	214	686	TCZ vs. PLACEBO	-423	0.007
MTX	102	-36	240	MTX vs. PLACEBO	-348	0.034
TCZ	27	-110	164	TCZ vs. MTX	-75	ns

Conclusions: Chronic inflammation results in an increased amount of tissue remodelling. There was a significant difference in the magnitude of effect MTX and TCZ on tissue remodelling. In addition there was a disconnect between tissue remodelling and change in disease activity, which was treatment dependent.

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FRI0009 **A COMPARISON OF THE JOINT SYNOVITIS AND TENOSYNOVITIS USING ULTRASONOGRAPHY AND HISTOPATHOLOGICAL FINDINGS IN PATIENTS WITH RHEUMATOID ARTHRITIS**

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Background: In the treatment of rheumatoid arthritis (RA), the early diagnosis and early medical treatment via tight control have become increasingly important with the advent of biological therapy. In addition, the existence of inflammation without bone destruction on magnetic resonance imaging has been found to be significantly associated with symptoms in the patient standpoint type inspection of early RA patients.

Objectives: This study was conducted to clarify the differences between the joint synovium and tendon sheath synovium, local disease activity using ultrasonography (US) and the findings on a synovial histopathological evaluation.

Methods: Between March 2011 and November 2017, 663 synovectomies were surgically treated, and synovial biopsies were performed at the time of surgery. Among them, 75 tendon sheath synovia and 588 joint synovia were investigated. A total of 81 men and 582 women were examined, with an average age of 64 years old. We examined the finger in 312 cases (39 tendons, 273 joints), wrist in 323 cases (33 tendons, 290 joints) and ankle in 28 cases (3 tendons, 25 joints). There were no cases with both tendon sheath synovium and joint synovium. Just before surgery, the US probe was placed on the dorsal and palmar/plantar aspect of the joint or the tendon sheath to evaluate the activity of local synovitis. The maximum grade of power Doppler (PD) signal was determined, ranging from 0 to 3. The serum C reactive protein (CRP), matrix metalloproteinase-3 (MMP-3) and DAS28 values were also examined just before surgery. A histopathological examination of the gathered synovium at the surgical site was performed using the Rooney score (RS).

Results: For the tendon sheath synovium, PD0, 14 cases; PD1, 32 cases; PD2, 19 cases and PD3, 10 cases were observed, with an average score of 1.33. For the joint synovium, PD0, 114 cases; PD1, 179 cases; PD2, 209 cases and PD3, 86 cases were observed, with an average score of 1.45. Regarding the DAS28, for the tendon sheath synovium, the average score was 3.59, and for the joint synovium, the average score was 3.61. Regarding the CRP, for the tendon sheath synovium, the average score was 0.64, and for the joint synovium, the average score was 0.66. Regarding the MMP-3, for the tendon sheath synovium, the average score was 113, and for the joint synovium, the average score was 123. There were no marked differences in the grade of PD, DAS28, CRP or MMP-3 between the synovia. The rate of synoviocytes hyperplasia did not differ between the synovia, but the rates of fibrosis and proliferating blood vessels were significantly high in the tendon sheath synovium, perivascular infiltrates of lymphocytes, focal aggregates of lymphocytes, diffuse infiltrates of lymphocytes was significantly high in joint synovium.

Conclusions: There was no marked difference in the US findings and the disease activity between the tendon sheath synovium and the joint synovium. However, there were differences in the local disease activities between the synovia. These results show that the tendon sheath synovium lacked acute inflammation.

Disclosure of Interest: None declared

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FRI0010 PREDICTION OF RADIOGRAPHIC PROGRESSION IN PATIENTS WITH RHEUMATOID ARTHRITIS BY BOTH MAGNETIC RESONANCE IMAGING AND ULTRASOUND

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Background: Magnetic resonance imaging (MRI) and ultrasound (US) are both useful modality to monitor disease status of RA whereas combination analysis of disease course by both modalities are quite few.

Objectives: To clarify the predictors of radiographic progression in patients with RA examined by both MRI and US.

Methods: Thirty-three patients with active RA, managed with a treat-to-target strategy and checked disease activity score every three months along with examination of both MRI and US, were enrolled from June 2010 to June 2016 and observed for 12 months. US of wrist and finger joints was examined every three months, MRI and radiograph were done every six months. US were evaluated by synovitis score of semi-quantitative manner by gray-scale (GS) and power Doppler (PD) proposed from EULAR. In MRI, synovitis, bone oedema and bone erosion were assessed by the Rheumatoid Arthritis Magnetic Resonance Imaging Scoring system (RAMRIS). Radiographic bone erosion and joint space narrowing (JSN) were scored by Genant-modified Sharp Score (GSS). Radiographic progression was defined as delta radiographic score >0.5. Multivariate analysis was employed to clarify independent predictors for radiographic progression at 12 month.

Results: Thirteen patients were treated with methotrexate monotherapy and eighteen were received combination of methotrexate and biologics. Three were given biologic monotherapy. Median of age was 57.0 years and that of disease duration was 9 months. Female was 84.8%, positive rate of RF was 87.1% and that of ACPA was 79.3%. DAS28-CRP was 4.20, total GS score 6.0, total PD score 4.0, MRI synovitis score 6.0, MRI bone oedema score 3.0, MRI bone erosion score 3.0, and GSS score 1.0 at baseline. Radiographic progression was found in 12 patients. Multivariate analysis revealed that high MRI bone oedema score at baseline, high MRI bone oedema score and PD $\geq$ grade 2 articular synovitis at any joints at 6 month were associated with radiographic progression at 12 months. Clinical indices of DAS28-CRP at any point did not predict radiographic progression compared with MRI or US.

	odds ratio	95% CI	p-value
MRI bone edema score at 0m	1.52	1.06-2.17	0.02
CRP at 0m	4.75	0.29-77.74	0.28
GSS JSN at 0m	1.05	0.80-1.38	0.72

MRI bone edema score at 6m	1.37	1.04-1.81	0.03
CRP at 6m	7.00	0.96-51.15	0.06

PD $\geq$ grade 2 at 6m	13.84	1.84-104.03	0.01
CRP at 6m	8.24	0.59-115.45	0.12

Conclusions: During treat-to-target strategy, the presence of MRI bone oedema as well as PD $\geq$ grade 2 articular synovitis are found to be important to predict radiographic outcome in active RA patients. These imaging indices may be more sensitive to monitor radiographic progression as compared with clinical indices.

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FRI0011 ULTRASONOGRAPHIC CRITERIA FOR THE DIAGNOSIS OF EROSIVE RHEUMATOID ARTHRITIS DISEASE USING OSTEOARTHRITIC PATIENTS AS CONTROLS COMPARED TO VALIDATED RADIOGRAPHIC CRITERIA

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Background: Rheumatoid arthritis (RA) is the most prevalent chronic inflammatory joint disease^{1,2} responsible for structural damage. Radiography (RX) is considered as the gold standard for visualising and quantifying bone lesions in RA.³ Musculoskeletal ultrasound (US) is booming in clinical practice for the diagnosis of RA. US can detect more erosions than RX at the joint level, especially at an early stage of the disease.⁴

Objectives: To determine thresholds for the diagnosis of erosive RA by US in RA and osteoarthritic (OA) patients and to compare these US thresholds with RX ACR/EULAR 2013 criteria for erosive RA.

Methods: Patients fulfilling ACR 1987 and/or ACR/EULAR 2010 criteria for RA or hand OA criteria were prospectively included. A modified Sharp erosion score was assessed by two blinded readers and one adjudicator for discordant cases (number of eroded joints $\leq$ three). Erosions in US were scored on six bilateral joints (MCP2-3, 5; MTP2-3, 5) with a four-grade scale to calculate total US score for erosions (USSE).

Results: A total of 168 patients were included: 122 RA (32 early RA <2 years; 90 late RA $\geq$ 2 years); 46 OA patients. On RX: 42 RA patients (6 early; 36 late) and 5 OA patients were eroded according to ACR/EULAR 2013 criteria with sensitivity at 34.4% and specificity at 89.1%. On US, 95 RA patients (21 early; 78 late) and 12 OA patients were eroded. Considering at least two joint facets eroded or at least one joint facet eroded at grade 2 on US, sensitivities were good (68%–72.1%) and specificities excellent (89.1%–100%). Agreement between RX and US was excellent (90%–92%). US diagnosed two times more patients than RX as erosive disease in both early and late RA patients.

Conclusions: USSE can differentiate RA from OA in erosive disease and detect two times more patients with erosive RA than RX with excellent specificity and agreement, according to two different criteria (number of facets eroded and severity of erosion at the joint facet level).

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FRI0012 SHARING THE BURDEN OF RHEUMATOID ARTHRITIS THROUGH REMOTE MONITORING OF RHEUMATOID ARTHRITIS (REMORA): IMPLICATIONS FOR PATIENTS AND CLINICIANS

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Background: People living with rheumatoid arthritis (RA) experience continuous, daily symptoms that fluctuate over time. Clinical decisions made by healthcare