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

DOI: 10.1136/annrheumdis-2018-eular.1707

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

A. Takatani¹, M. Tamai¹, N. Ohki², Y. Nakashima¹, Y. Endou¹, S. Tsuji¹, T. Shimizu¹, M. Umeda¹, S. Fukui¹, R. Sumiyoshi¹, A. Nishino¹, T. Koga¹, S. Kawashiri¹, N. Iwamoto¹, T. Igawa¹, K. Ichinose¹, K. Arima³, H. Nakamura¹, T. Origuchi¹, S. Sato⁴, M. Uetani², A. Kawakami¹. ¹Department of Immunology and Rheumatology; ²Department of Radiological Sciences; ³Department of Public Health, Nagasaki University Graduate School of Biomedical Sciences; ⁴Clinical Research Center, Nagasaki University Hospital, Nagasaki, Japan

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 ≥ 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 ≥ 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 ≥ 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.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.4555

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

C. Roux¹, F. Gandjbakhch², A. Pierresnard², M. Couderc³, C. Lukas⁴, R. Masri⁵, J.-P. Sommier¹, I. Clerc-Urmes⁶, C. Baumann⁵, I. Chary-Valckenaere¹, D. Loeuille¹. ¹Rheumatology, University Hospital of Nancy, Vandoeuvre-lès-Nancy; ²Rheumatology, Academic Hospital Pitié Salpêtrière, Paris; ³Rheumatology, University Hospital of Clermont-Ferrand, Clermont-Ferrand; ⁴Rheumatology, University Hospital of Lapeyronie, Montpellier; ⁵Rheumatology, University Hospital of Nancy, Vandoeuvre-lès-Nancy; ⁶Platform of Clinical Research Support PARC, University Hospital of Nancy, Vandoeuvre-lès-Nancy, France

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 ≤ 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 ≥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).

REFERENCES:

- Guillemin F, et al. Prevalence of rheumatoid arthritis in France: 2001. *Ann Rheum Dis* 2005 Oct;64(10):1427–30.
- Alamanos Y, et al. Incidence and prevalence of rheumatoid arthritis, based on the 1987 American College of Rheumatology criteria: A systematic review. *Semin Arthritis Rheum* 2006 Dec;36(3):182–8.
- Baillet A, et al. Comparison of the efficacy of sonography, magnetic resonance imaging and conventional radiography for the detection of bone erosions in rheumatoid arthritis patients: a systematic review and meta-analysis. *Rheumatol Oxf Engl* 2011 Jun;50(6):1137–47.
- Wakefield RJ, et al. The value of sonography in the detection of bone erosions in patients with rheumatoid arthritis: a comparison with conventional radiography. *Arthritis Rheum* 2000 Dec;43(12):2762–70.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.2832

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

C.A. Sharp¹, L. Austin², M. Machin³, J. Humphreys⁴, P. Mellor⁴, J. McCarthy⁵, S. van der Veer¹, L. Davies², J. Ainsworth⁶, C. Sanders², W. Dixon¹. ¹Arthritis Research UK Centre for Epidemiology; ²NIHR School for Primary Care Research; ³The Farr Institute of Health Informatics Research; ⁴NIHR CLAHRC GM; ⁵Alliance Manchester Business School; ⁶Centre for Health Informatics, The University of Manchester, Manchester, UK

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

professionals at intermittent consultations rely upon history taking, which is subject to pitfalls including recall bias, variable help-seeking behaviours and difficulty in summarising fluctuating symptoms.

Objectives: REMote MONitoring in Rheumatoid Arthritis (REMORA) was a pilot study to design, implement and evaluate a system of remote data collection for RA patients, for health and research purposes. A unique feature was its aim to integrate patient-generated data from a smartphone app into the electronic health record (EHR).

Methods: Semi-structured interviews with key stakeholders informed project design and evaluation, comprising three stages: 1) co-design of smartphone app prototype and integration into the electronic patient record (EHR); 2) end-to-end prototype testing (1 month); 3) evaluation of feasibility and acceptability (3 months).

Qualitative data from audio-recorded interviews and 'routine' consultations, following app use, were coded using *a priori* and emergent themes, and triangulated.

Results: Daily, weekly and monthly question sets were developed. Patients tracked daily symptoms for one month (n=8) and three months (n=20). Patients submitted daily scores on most days (median 91% of days; IQR 78%-95%) with 4/20 patients submitting on <60% days. Further detail on feasibility has been reported elsewhere.¹ REMORA data were successfully integrated into the EHR (figure 1).

Data from interviews with 16 patients, 2 clinician-researchers (WD and CAS) and 17 clinical consultations were analysed. Patients and clinicians found remote monitoring acceptable and easy to use.

Three themes emerged with REMORA data providing the 'bigger picture' by highlighting episodes that might otherwise have been missed, for example short-lived flares and gradual changes in disease; **empowering patients** through increased self-awareness and improved understanding of RA; and **changing the nature of consultations** with graphs integrated into the EHR facilitating shared conversations and leading to more personalised care.

Conclusions: This study demonstrates the acceptability and feasibility of the REMORA system. Novel integration of patient-generated data into the EHR positively impacted consultations and was felt to empower patients. The system generated a unique, temporally-rich research dataset. The next challenge is to scale-up and spread the adoption of this innovation across a range of clinical contexts.

REFERENCE:

- [1] Van Der Veer S, Austin L, Sanders C, Dixon W. FRI0175 Using smartphones to improve remote monitoring of rheumatoid arthritis: completeness of patients' symptom reports. BMJ Publishing Group Ltd 2017.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.4873

FRI0013

CONVERTING PATIENT-REPORTED PHYSICAL FUNCTION OUTCOMES SCORES TO PROMIS METRIC SCORES IN PHASE 3 TRIALS OF BARICITINIB IN RHEUMATOID ARTHRITIS

C.O. Bingham III¹, C. Gaich², A.M. DeLozier², A. Quebe², L. Sun², S. Otawa², J. Pope³. ¹Johns Hopkins University, Baltimore; ²Eli Lilly and Company, Indianapolis, USA; ³Joseph's Health Care, London, Alberta, Canada

Background: In patients (pts) with RA, physical function (PF) can be measured with the Health Assessment Questionnaire-Disability Index (HAQ-DI). Patient-Reported Outcomes Measurement Information System (PROMIS) was developed by the National Institutes of Health using a population-calibrated T-score metric (Mean 50, SD 10). Crosswalk tables that link legacy instruments to PROMIS instruments, including PF, have been developed. Comparisons to the general population can also be made from PROMIS scores.¹⁻²

Objectives: To convert HAQ-DI scores to PROMIS PF scores to determine how the PROMIS metric performs in 2 phase 3 baricitinib (bari) clinical trials in pts with RA.

Methods: In RA-BEAM, pts with inadequate response (IR) to methotrexate were randomised 3:3:2 to placebo (PBO) once daily (QD), bari 4 mg QD, or adalimumab (ADA) 40 mg biweekly.³ In RA-BEACON, pts with IR to bDMARDs were randomised 1:1:1 to receive PBO or bari 2 mg or 4 mg QD.⁴ In both studies, PF was assessed using HAQ-DI. Patient-level HAQ-DI scores were converted to PROMIS PF scores using a validated crosswalk table.¹ Analysis of covariance was conducted on the PROMIS PF score conversions to compare bari to all treatment arms in both studies. Missing data were imputed using modified last observation carried forward.

Results: Pts had considerable PF impairment at baseline; mean scores exceeded 2 SD (20 points on the T-score metric) from population means (table 1). Treatment with bari was associated with clinically relevant improvements approaching or exceeding 0.5 SD (5 points on the T-score metric) by week 24 (minimally important difference for PROMIS PF: 0.2 SD or 2 points⁵) vs PBO in HAQ-DI converted to PROMIS PF scores (table 1). Using the converted PROMIS scores, bari remained associated with significant improvements in PF vs PBO through 24 weeks in both studies and vs ADA through 52 weeks in RA-BEAM (figure 1).

Abstract FRI0013 – Table 1. PROMIS Physical Function scores^a converted from HAQ-DI in RA-BEAM and RA-BEACON

	RA-BEAM			RA-BEACON ^b		
	PBO (n=488)	Bari-4 mg (n=487)	ADA (n=330)	PBO (n=176)	Bari-2 mg (n=174)	Bari-4 mg (n=177)
Baseline	31.9 (6.8)	31.9 (6.6)	31.7 (7.5)	30.0 (5.3)	30.7 (5.7)	30.3 (6.1)
Week 1	33.8 (7.0)	35.0 (7.5)	35.0 (8.0)	30.7 (5.6)	32.8 (6.3)	32.4 (7.6)
Week 4	34.5 (7.7)	37.6 (8.8)	36.7 (8.3)	31.6 (6.2)	33.5 (6.9)	33.7 (8.8)
Week 12	35.9 (8.6)	39.4 (9.5)	37.8 (9.0)	32.1 (6.8)	34.9 (8.5)	35.1 (8.5)
Week 24	36.0 (8.7)	40.8 (10.3)	39.1 (9.7)	31.6 (6.4)	35.2 (9.0)	35.7 (10.2)
Week 52		41.2 (10.2)	39.6 (10.1)			

Data are mean (SD)

^aHigher PROMIS Physical Function score means better physical function.

^bRA-BEACON was a 24 week study

ADA=adalimumab; bari=baricitinib; PBO=placebo

Abstract FRI0013 – Figure 1. Change from baseline for PROMIS Physical Function converted from HAQ-DI in RA-BEAM and RA-BEACON

Conclusions: While RA-BEAM and RA-BEACON did not use the PROMIS instrument directly, these results indicate PROMIS PF has the potential to show responsiveness and differentiate between active treatments in clinical trials.

REFERENCES:

- [1] Schalet, et al. J Gen Intern Med 2015;30:1517–23;
[2] Cook, et al. Qual Life Res 2015;24:2305–18.
[3] Taylor, et al. NEJM 2017;376:652–62.
[4] Genovese, et al. NEJM 2016;374:1243–52.
[5] Hays, et al. Ann Rheum Dis 2015;74:104–7.

Disclosure of Interest: C. Bingham III Grant/research support from: BMS, Consultant for: Eli Lilly and Company, Janssen, Pfizer, UCB, BMS, Sanofi/Regeneron,