present/absent by global assessment was analysed using kappa. Reliability of detailed scoring was analysed by intraclass correlation coefficient (ICC).

Results: Reliability of detection of active and structural lesions was comparable and somewhat better when DICOM images were evaluated (table 1). The most frequently detected active lesion, subchondral inflammation, was detected to a comparable degree of reliability as the most frequently detected structural lesion, erosion. Fat metaplasia in the joint space (backfill) and ankylosis were also reliably detected despite low frequency of occurrence in this cohort. Mean ICC for detailed scores were BME-0.84, Erosion-0.55, Fatty lesion (any)–0.61, Fatty lesion (>1 cm depth)–0.55, Sclerosis-0.73, Fat metaplasia in joint space-0.36, Ankylosis-0.97, Bone bud-0.07.

Abstract FRI0169 – Table 1. Kappa values for detection of MRI lesions in the SIJ of patients in the ASAS-CC

*Based on all images (n=278).	**Based on DICOM images (n=175).	
	Mean of all reader pairs (95% CI)*	Mean of all reader pairs (95% CI)**
Active lesions typical of axSpA	0.73 (0.64-0.81)	0.70 (0.58-0.82)
Active lesions typical of axSpA (confidence ≥3) (1-4 scale)	0.77 (0.68-0.86)	0.80 (0.69-0.92)
ASAS positive MRI	0.74 (0.65-0.82)	0.73 (0.61-0.84)
ASAS positive MRI (confidence ≥3) (1-4 scale)	0.76 (0.67-0.85)	0.79 (0.67-0.90)
Structural lesions typical of axSpA	0.64 (0.53-0.74)	0.71 (0.59-0.83)
Structural lesions typical of axSpA (confidence ≥3) (1-4 scale)	0.61 (0.49-0.74)	0.75 (0.62-0.88)
Subchondral inflammation	0.66 (0.57-0.75)	0.60 (0.49-0.72)
Inflammation in Erosion cavity	0.29 (0.11-0.47)	0.37 (0.15-0.58)
Capsulitis	0.37 (0.12-0.62)	0.55 (0.18-0.90)
Joint fluid	0.35 (0.21-0.50)	0.41 (0.23-0.59)
Enthesitis	0.21 (0.04-0.39)	0.23 (0.03-0.45)
Sclerosis	0.42 (0.30-0.55)	0.48 (0.33-0.63)
Erosion	0.59 (0.47-0.70)	0.61 (0.47-0.75)
Fatty lesion (any)	0.61 (0.50-0.73)	0.61 (0.46-0.76)
Fatty lesion >1cm	0.57 (0.41-0.73)	0.66 (0.47-0.84)
Fat metaplasia in joint space	0.47 (0.27-0.67)	0.50 (0.26-0.74)
Bone bud	0.14 (-0.03-0.31)	0.11 (-0.06-0.29)
Ankylosis	0.54 (0.22-0.86)	0.58 (0.25-0.89)

*Based on all images (n=278); **Based on DICOM images (n=175)

Conclusions: The reliability of the ASAS_MRI_defⁿ was substantial for the most frequently detected lesions.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.7144

FRI0170 CONSENSUS DEFINITIONS FOR MRI LESIONS IN THE SACROILIAC JOINTS OF PATIENTS WITH AXIAL SPONDYLOARTHRITIS: FIRST ANALYSIS FROM THE ASSESSMENTS IN SPONDYLOARTHRITIS INTERNATIONAL SOCIETY (ASAS) CLASSIFICATION COHORT

W.P. Maksymowych¹, S.J. Pedersen², X. Baraliakos³, P. Machado⁴, U. Weber⁵, J. Sieper⁶, S. Wichuk¹, D. Poddubnyy⁶, M. Østergaard⁷, R.G. Lambert⁸. ¹Medicine, University of Alberta, Edmonton, Canada; ²Rheumatology, Gentofte Hospital, Copenhagen, Denmark; ³Rheumatology, Rheumazentrum Ruhrgebiet, Herne, Germany; ⁴Rheumatology, University College London, London, UK; ⁵Rheumatology, King Christian 10th Hospital for Rheumatic Diseases, Graasten, Denmark; ⁶Rheumatology, Charité Universitätsmedizin Berlin, Berlin, Germany; ⁷Rheumatology, Copenhagen Center for Arthritis Research, Copenhagen, Denmark; ⁸Radiology, University of Alberta, Edmonton, Canada

Background: A broad spectrum of MRI lesions has been described in the sacroiliac joint (SIJ) of patients with axial spondyloarthritis and a recent consensus from the ASAS MRI group has culminated in updated lesion definitions (ASAS_MRI_defⁿ). There has been no central reader evaluation of MRI scans from the ASAS Classification Cohort (ASAS-CC)¹ to determine the spectrum of MRI lesions in the SIJ in this cohort, to compare the frequencies of different lesion types, and to compare detection of lesions between central and ASAS-CC local site readers

Objectives: To determine the spectrum and compare the frequencies of active and structural lesions on MRI images from the ASAS-CC according to the consensus ASAS_MRI_defⁿ update.

Methods: ASAS_MRI_defⁿ were recorded in an eCRF that comprises global assessment (lesion present/absent) and detailed scoring (SPARCC SIJ inflammation, SPARCC SIJ structural). For global assessment, wording of lesions defining active and structural lesions typical of axSpA was the same as in the original ASAS-CC eCRF permitting comparisons between central and local site readers. MRI images were available in a variety of formats (DICOM (n=175), JPEG(n=71), DICOM film(n=32)) and sequences, axial and semicoronal orientations, from 278 of the 495 cases who had MRI performed in the ASAS-CC. Image quality was considered sufficient to record global data by 6 central readers in all cases. An additional reader assessed only images in DICOM format (n=175). Detailed SPARCC scoring data was based only on assessment of images in DICOM format. Comparison of active and structural lesion frequencies was assessed descriptively according to individual and majority of central readers data. Detection of active

lesions typical of axSpA in all available images from the ASAS-CC was compared between central and local readers.

Results: The percentage of cases with active lesions typical of axSpA recorded by central readers (28.4% by majority read) was lower than the 40% reported by local site readers in the ASAS-CC (table 1). This was similar to the frequency of structural lesions typical of axSpA (28.6% by majority read) (table 2). 11.2% had subchondral inflammation but not active lesions typical of axSpA but only 0.3% had active lesions typical of axSpA without subchondral inflammation. Erosion was the most frequently observed structural lesion (25.2%) followed by fatty lesion (19.8%). Results were very similar when only data from the 175 DICOM cases was analysed.

Abstract FRI0170 – Table 1. Frequencies of active MRI lesions in the SIJ in the ASAS-CC

Variable	Mean% (Range) of cases*	Number (%) of cases*
Active lesions typical of axSpA	31.5 (24.5-38.5)	79 (28.4%)
Active lesions typical of axSpA and level of confidence ≥3 (scale of 1-4)	22.4 (18.0-27.3)	58 (20.9%)
Active lesions typical of axSpA and meets ASAS definition for positive MRI	30.0 (22.6-37.4)	71 (25.5%)
Meets ASAS definition for positive MRI and level of confidence ≥3 (scale of 1-4)	23.1 (18.3-30.2)	58 (20.9%)
Subchondral inflammation	43.5 (38.5-51.1)	110 (39.6%)
Site of erosion cavity inflammation	8.9 (5.8-12.6)	10 (3.6%)
Capsulitis	4.0 (1.8-7.2)	6 (2.2%)
Joint Fluid	14.1 (6.8-20.5)	11 (4.0%)
Enthesitis	7.5 (1.8-12.2)	6 (2.2%)

(*Individual data from 6 readers; majority reader (≥4) data).

Abstract FRI0170 – Table 2. Frequencies of structural MRI lesions in the SIJ in the ASAS-CC

Variable	Mean% (Range) of cases*	Number (%) of cases*
Structural lesions typical of axSpA	31.4 (23.5-39.9)	68 (28.6%)
Structural lesions typical of axSpA and level of confidence ≥3 (scale of 1-4)	20.8 (14.0-29.4)	46 (19.3%)
Subchondral sclerosis	24.2 (10.1-39.1)	36 (15.1%)
Erosion	27.9 (23.1-32.8)	60 (25.2%)
Fatty lesion (any)	23.5 (18.1-29.8)	47 (19.8%)
Fatty lesion >1cm	11.7 (8.0-15.6)	22 (9.2%)
Bone bud (yes)	2.1 (0.4-3.8)	1 (0.4%)
Fat metaplasia in joint space (yes)	8.1 (4.2-10.5)	11 (4.6%)
Ankylosis	1.1 (0.8-3.8)	5 (2.1%)

(*6 readers; majority reader (≥4) data).

Conclusions: In this first central reader analysis of MRI images from the ASAS-CC we demonstrate similar frequencies of active and structural lesions typical of axSpA, erosion as a common lesion, some degree of false positive subchondral inflammation, and a lower frequency of active lesions typical of axSpA than noted by local site readers.

REFERENCE:

[1] Rudwaleit, et al. Ann Rheum Dis 2009;68:777–831.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.7223

FRI0171 WHICH IMAGING OUTCOMES FOR AXSPA ARE MOST SENSITIVE TO CHANGE? A 5-YEAR ANALYSIS OF THE DESIR COHORT

A. Sepriano¹, S. Ramiro¹, D. van der Heijde¹, M. Dougados², P. Claudepierre³, A. Feydy⁴, M. Reijnders⁵, D. Loeuille⁶, R. Landewé⁷. ¹Rheumatology, Leiden University Medical Centre, Leiden, Netherlands; ²Rheumatology, Hôpital Cochin; ³Radiology, Hôpital Henri-Mondor; ⁴Radiology, Hôpital Cochin, Paris, France; ⁵Radiology, Leiden University Medical Centre, Leiden, Netherlands; ⁶Rheumatology, Hôpital Brabois, Nancy, France; ⁷Rheumatology, Amsterdam Rheumatology and Clinical Immunology Center (ARC), Amsterdam, Netherlands

Background: Several imaging outcomes have become available to assess inflammation and structural damage over time in patients with axial spondyloarthritis (axSpA). However, no formal comparison of their sensitivity to change has been made in the early phases of the disease.

Objectives: We aimed to compare the sensitivity to change of different MRI and radiographic scoring methods in patients with early axSpA.

Methods: Patients from the DESIR cohort fulfilling the ASAS axSpA criteria were included. Radiographs and MRI of the sacroiliac joints and spine were obtained at baseline, 1 year, 2 years and 5 years. Each film was scored by 2 or 3 readers in 3 'reading-waves' (wave 1: baseline; wave 2: baseline, 1 year, 2 years; wave 3: baseline, 2 years, 5 years). Outcomes measuring inflammation and structural damage both on MRI and radiographs in the spine and SIJ were assessed (table 1). The analysis of change captured over time was performed using generalised estimating equations (GEE) longitudinal models separately for each outcome, taking into account data from all readers and waves ('integrated analysis'). To allow

comparisons across outcomes, these were standardised (difference between the individual score and the mean of all scores divided by the standard deviation, per reader, wave and time-point) before running the models. The higher the standardised coefficient the more change in inflammation/damage is captured.

Results: In total, 345 patients were included (mean (SD) symptom duration: 1.6 (0.9) years; 53% males; 89% HLA-B27 positive). Inflammation on MRI-SIJ (according to both the ASAS definition of sacroiliitis and the continuous SPARCC score) was more sensitive to change as compared to inflammation on the spine that remained essentially unchanged regardless of the outcome (table 1). Structural damage on the SIJ was found to increase over time, but with a higher standardised yearly rate of change on MRI-SIJ (range: 0.015–0.274) as compared to X-SIJ (range: 0.043–0.126). Notably, ≥ 3 Fatty lesions on MRI-SIJ was the structural outcome in the SIJ with highest sensitive to change (0.274), while ≥ 3 erosions was the least sensitive (0.015). Spine structural damage slowly progressed over time but, in contrast to SIJ, radiographic outcomes (i.e. ≥ 1 syndesmophytes and mSASSS) were more sensitive to change than MRI structural outcomes.

Conclusions: Our data adds to the body of evidence showing that structural damage assessed in pelvic radiographs only has low sensitivity to change. MRI-SIJ is a promising alternative (especially fatty lesions) capturing more structural changes. In contrast, in detecting structural change in early axSpA radiographic outcomes outperform MRI outcomes.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.1596

FRI0166 CHARACTERISATION OF PHOSPHODIESTERASE 4 (PDE4) BLOCKADE IN THE SYNOVIUM OF PSORIATIC ARTHRITIS PATIENTS: A FOCUS ON SYNOVIAL INVASIVENESS AND T-CELL POLYFUNCTIONALITY

S.M. Wade¹, M. Canavan¹, T. McGarry¹, S.C. Wade¹, D.J. Veale², U. Fearon¹.

¹Molecular Rheumatology, Trinity College Dublin; ²Center for Arthritis and Rheumatic Diseases, St. Vincents University Hospital, Dublin, Ireland

Background: Owing to the multi-faceted nature of the pathogenesis of psoriatic arthritis (PsA), the development of multi-targeted agents has been an area of intensive research. Such agents include the phosphodiesterase 4 (PDE4) inhibitors, Rolipram and Apremilast, which elevate intracellular cAMP levels to modulate a number of anti-inflammatory mechanisms. However, the effect of PDE4 blockade within the complex inflammatory environment of the inflamed synovium remains to be elucidated.

Objectives: To characterise the effect of PDE4 blockade in PsA using *ex vivo* synovial whole tissue explants and synovial single cell suspensions reflective of the complex synovial micro-environment.

Methods: *Ex-vivo* PsA whole tissue synovial explants were cultured in the presence of PDE4 inhibitor, Rolipram, for 24 hour. The expression of pro-inflammatory mediators were quantified by ELISA and MSD multiplex. A 21 day synovial explant matrigel model was utilised to examine synovial fibroblast (SFC) invasiveness to allow for a long-term assessment. For the characterisation of synovial T-cells, synovial explants were digested and cultured in the presence of Rolipram for 8 hours, stimulated and stained for surface and intracellular T-cell markers. Cell surface expression of CD161 was used to identify Th17 lineage (CD161+Th17 and exTh17 cells) or non-Th17 lineage (CD161-) Th1 cells. SPICE analysis was utilised to determine the proportions of mono- and polyfunctional T-cells, which were correlated with disease activity scores.

Results: Rolipram treatment inhibited the spontaneous secretion of inflammatory mediators IL-6, IL-8, MCP-1 and MMP-1 (all $p < 0.05$), with a parallel increase in IL-10 expression. Under DMSO control conditions, a significant increase in SFC outgrowths from PsA explants (indicative of SFC invasiveness) was observed from day 8–21 (all $p < 0.05$), effects of which were significantly decreased in the presence of Rolipram (all $p < 0.05$). A comparative analysis of T cells in PsA PBMC and synovial tissue revealed an enrichment of Th1 ($p < 0.05$), Th17 ($p = 0.06$) and exTh17 ($p < 0.05$) cells in PsA synovial tissue, which displayed distinct polyfunctional cytokine profiles, in particular Th17 cells, as compared to matched PBMC. The frequency of polyfunctional triple positive GM-CSF/TNF/IL-17 and/or IFN γ producing Th1 ($r = 0.8$, $p < 0.05$), Th17 ($r = 0.6$, $p < 0.16$) and exTh17 ($r = 0.9$, $p < 0.05$) cells positively correlated with PsA disease activity, suggesting an important role of T-cell polyfunctionality in PsA synovial pathogenesis. Analysis of synovial tissue cell suspensions and matched PBMC cultured in the presence of Rolipram showed a significant decrease in the proportion of these triple positivesynovial T cells compared to DMSO ($p < 0.05$), suggesting that PDE4 blockade can effectively targets the polyfunctional hyper-pathogenic synovial T cells in PsA, particularly polyfunctional CD8+T cells and Th17 lineage, Th17 and exTh17 cells.

Abstract FRI0171 – Table 1. Standardised rate of change of imaging outcomes over 5 years of follow-up in early axSpA patients from the DESIR-cohort who fulfil the ASAS axSpA classification criteria.

Imaging outcomes	Baseline score* (N=313-344)	Standardized rate of change/year $\pm$
SACROILIAC JOINTS		
Inflammatory lesions (MRI-SIJ)		
Sacroiliitis (ASAS criteria)	134 (39.2%)	-0.278
SPARCC SIJ score (0-72)	4.7 (7.9)	-0.441
Structural lesions (MRI-SIJ)		
≥ 5 fatty lesion and / or erosions	66 (19.5%)	0.238 ^{††}
≥ 3 erosions	60 (17.7%)	0.015
≥ 3 fatty lesions	56 (16.5%)	0.274
Number of fatty lesions and/or erosions (0-80)	2.9 (4.9)	0.111
Number of erosions (0-40)	1.3 (2.2)	0.030
Number of fatty lesions (0-40)	1.5 (3.5)	0.140
Total structural lesions $\forall$ (0-144)	3.4 (5.9)	0.115
Total structural lesions without sclerosis (0-104)	3.2 (5.8)	0.124
Structural lesions (X-SIJ)		
mNY dichotomous	73 (21.2%)	0.044
mNY 1-grade change	NA	0.126
mNY 1-grade change and value ≥ 2	NA	0.119
mNY continuous grade (0-8)	1.7 (1.8)	0.043
SPINE		
Inflammatory lesions (MRI-Spine)		
BME: ≥ 3 lesions	32 (9.4%)	-0.032
BME: ≥ 5 lesions	19 (5.6%)	-0.030
SPARCC Spine score (0-414)	2.6 (7.7)	-0.050
Berlin Spine score (0-69)	0.9 (2.7)	-0.055
Structural lesions (MRI-Spine)		
≥ 5 fatty lesions	5 (1.6%)	-0.013
Total structural lesions [†] (0-322)	0.4 (1.0)	0.016
Number of fatty lesions (0-92)	0.3 (0.8)	0.008
Number of corner erosions (0-92)	0.1 (0.2)	0.012
Number of corner bone spurs (0-92)	0.1 (0.3)	0.027
Structural lesions (X-Spine)		
≥ 1 syndesmophyte	19 (5.5%)	0.037
mSASSS score (0-72)	0.3 (1.3)	0.043

* Agreement of ≥ 2 out of 3 readers for binary variables and mean (SD) of 3 readers for continuous variables from wave 3; $\forall$ fatty lesions, erosions, sclerosis, partial ankylosis, total ankylosis; [†]fatty lesions, erosions, bone spurs, ankylosis; NA, not applicable.

Conclusions: PDE4 blockade mediates broad anti-inflammatory mechanisms in PsA synovial tissue through the reduced expression of pro-inflammatory mediators, decreased invasiveness and reduced T cell polyfunctionality. We also demonstrate the feasibility of using *ex vivo* models to determine “*in situ* like” assessments of therapeutic agents and further our understanding of disease pathogenesis.

Disclosure of Interest: None declared

DOI: 10.1136/annrheumdis-2018-eular.6952

FRI0167 EXPRESSION LEVELS OF IL-17, IL-22 AND IL-23 RECEPTORS IN FOUR OSTEOBLAST MODELS AND THE EFFECTS OF IL-17, IL-22 AND IL-23 ON OSTEOBLASTS

J.-R. Zhang¹, S.-M. Dai². ¹Department of Rheumatology and Immunology; ²Department of Rheumatology and Immunology, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, Shanghai, China

Background: Ankylosing spondylitis (AS) is a chronic inflammatory joint disease that chiefly affects the sacroiliac joints and the spine. Radiographs reveal erosive changes at the corners of the vertebral bodies in the early stages of disease, and outgrowth of bony spurs known as syndesmophytes in the later stages. Some data imply a pivotal role of IL-23/IL-17 axis in the regulation of bone homeostasis. However, it remains unknown whether IL-17, IL-22 or IL-23 has any direct effects on osteoblasts or new bone formation in AS.

Objectives: To examine the expressions of IL-17, IL-22, and IL-23 receptors in four osteoblast models and the effects of IL-17, IL-22, and IL-23 on osteoblasts.

Methods: Gene expression levels of receptors, alkaline phosphatase (ALP), osteocalcin (OCN), and Runx-related transcription factor 2 (Runx-2), were