THU0360

INCREASING IMPACT ON STRUCTURAL DAMAGE WITH INCREASING CUMULATIVE INFLAMMATION AT THE SI-JOINT QUADRANT LEVEL IN AXIAL SPONDYLOARTHRITIS – 5-YEAR DATA FROM THE DESIR COHORT

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Background: Axial inflammation is a key feature in axial SpA (axSpA). There is lack of data relative to the persistence of BME in the same anatomical quadrant (Q, 8 in total for both SIJ together), regardless of the overall presence of BME.

Objectives: This study aims to investigate particular patterns of distribution of SIJ-BME across quadrants over time, their persistence over time, and their impact on clinical and structural outcomes.

Methods: Patients from the DESIR cohort (early axSpA according to the rheumatologist) with MRI-SIJ available at baseline, 2 and 5 years were included. Each image was scored by 3 trained central readers blinded to chronological order. BME was considered positive if detected in $\geq 1/6$ slices in each of the 8 quadrants, according to each individual reader. Four different patterns of BME over time were defined (no BME, sporadic pattern, fluctuating BME and persistent BME) considering all 8 quadrants (Figure). The effect of BME patterns on 5-year structural (mNY, mSASSS, ≥ 5 erosions and/or fatty lesions in MRI-SIJ) and clinical outcomes (BASFI, BASMI and ASQoL) was evaluated using multilevel generalised estimating equations (GEE) models (taking the individual reader data into account) and linear regression (using the agreement of ≥ 2 out of 3), as appropriate. All models were adjusted for relevant confounders including treatment (Table).

Results: In total, 136 patients were included (age 34 (SD 9) years, 50% male, and 63% HLA-B27 positive). 'No BME' was seen in 63 patients (46%), the 'sporadic pattern' in 34 patients (25%), the 'fluctuating pattern' was seen in 21 patients (15%) and the 'persistent BME pattern' was seen in 18 patients (13%). Compared to the 'no BME' pattern (reference), the 'sporadic' [OR (95% CI): 2.1 (1.0;4.5)], 'fluctuating' [OR: 5.6 (2.2;14.4)] and 'persistent' [OR: 7.5 (2.8;19.6)] patterns were associated with higher likelihood to be mNY positive at 5-years, suggesting a gradient between cumulative inflammation and damage. Similar findings were observed for mNY as a continuous outcome variable and for ≥ 5 erosions and/or fatty lesions on spinal MRI as outcomes, but not for mSASSS (Table). There was no association between the BME patterns and the clinical outcomes.

Conclusion: Only 13% of the patients showed persistent inflammation in the same Q over a 5-year period and in 15% inflammation was fluctuating across different Qs. More structural damage was found in patients with increasing cumulative levels of local inflammation in the quadrant. Even when BME (temporarily) disappears there is an important effect on structural outcomes, and that effect is independent of treatment.

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Figure. Graphical representation of examples of presentation of BME throughout time (baseline, 2 and 5 years) across 8 SIJ quadrants combined into four patterns. **No BME:** No BME in all observations; **Sporadic BME:** Other pattern of BME (not included in the previous); **Fluctuating BME:** Fluctuating BME at any of the 8 quadrants (e.g. 1-0-1 or 0-1-0), without simultaneous persistent BME in the remaining quadrants; **Persistent BME:** Constant BME, in at least one quadrant, regardless of the pattern of BME in the remaining quadrants.

Table – Association between SIJ-BME patterns and structural and clinical outcomes

Outcome at 5 years	N	No BME	Sporadic BME	Fluctuating BME	Persistent BME
mNY (0-8) ^a	124	(reference)	0.4 (0.1;0.8)	1.7 (1.1;2.3)	2.3 (1.6;3.0)
mNY (yes/no) ^b	124	(reference)	2.1 (1.0;4.5)	5.6 (2.2;14.4)	7.5 (2.8;19.6)
mSASSS (0-72) ^a	117	(reference)	-0.2 (-0.9;0.6)	-0.3 (-1.3;0.3)	-0.5 (-1.3;0.3)
≥ 5 erosions and/or fatty lesions on MRI (yes/no) ^b	127	(reference)	2.9 (1.4;5.9)	4.2 (1.6;10.8)	8.1 (4.1;16.6)
BASFI (0-10) ^c	124	(reference)	-2.1 (-8.8;4.7)	-5.9 (-14.5;2.7)	0.2 (-8.5;8.9)
BASMI (0-10) ^c	117	(reference)	-0.03 (-0.44;0.38)	-0.43 (-0.99;0.13)	0.03 (-0.49;0.56)
ASQoL (0-18) ^c	123	(reference)	-1.3 (-2.9;0.3)	-2.2 (-4.2;-0.2)	-0.7 (-2.7;1.3)

^a Estimated by linear GEE, ^b Estimated by binomial GEE, ^c Estimated by linear regression

All analyses are adjusted for symptom duration, sex, smoking status, HLA-B27, medication (NSAID, csDMARD, bDMARD) and ASDAS.

Abstract THU0360 – Figure 1

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THU0361

DIAGNOSTIC PERFORMANCE OF MRI LESIONS IN THE SACROILIAC JOINTS ACCORDING TO UPDATED ASAS LESION DEFINITIONS: A CENTRAL READER ASSESSMENT OF MRI SCANS FROM THE ASSESSMENTS IN SPONDYLOARTHRITIS CLASSIFICATION COHORT

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Background: The ASAS MRI group has generated updated lesion definitions for MRI lesions in the SIJ. While the ASAS definition of a positive MRI for classification purposes remains unchanged, these additional ASAS definitions for active and structural lesions may also be of diagnostic value. It is important to understand their relative contribution and complementarity as diagnostic indicators.

Objectives: To determine optimal cut-offs for the number of SIJ quadrants with MRI lesions reflecting diagnosis of axSpA in patients with undiagnosed back pain.

Methods: MRI lesions on baseline scans from the ASAS Classification Cohort were recorded by 7 experienced readers from the ASAS-MRI group. Detailed scoring of lesions per SIJ quadrant (SPARCC SIJ quadrant method) was available for assessment of bone marrow edema (BME) and structural lesions in 158 and 146 cases, respectively, who were diagnosed by the local rheumatologist at baseline. Of these, 86 and 79 cases with BME and structural lesion data, respectively, were also diagnosed by the local rheumatologist at follow up (mean 4.4 years). We calculated sensitivity and specificity for varying numbers of SIJ quadrants with MRI lesions with rheumatologist diagnosis of axSpA at baseline and follow up as gold standard.

Results: Lesion cut-offs based on BME were most sensitive for diagnosis at baseline and follow up but erosion- and fatty-lesion cut-offs were more specific (Table). At least 2 SIJ quadrants with erosion or fat metaplasia were associated with $>90\%$ specificity for the diagnosis of axSpA. There was also a consistent improvement in the sensitivity and specificity performance of cut-offs based on erosions and fatty lesions according to diagnosis at baseline and at follow up after 4.4 years but not for cut-offs based on BME. Lesion cut-offs that combined BME and/or erosion enhanced sensitivity without compromising specificity.