Diagnostics and imaging procedures

SAT0525 IMMUNOSCINTIGRAPHY OF SACROILIAC JOINTS SHOWS VERY GOOD AGREEMENT WITH INFLAMMATION ON MRI IN AXIAL SPONDYLOARTHRITIS PATIENTS

Philippe Carron[1,2], Manouk de Hooge[1,2], Thomas Renson[1,2], Bieke Lambert[3], Kathia De Man[3], Dirk Elewaut[1,2], Filip van den Bosch[1,2]. [1]*Ghent University Hospital, Rheumatology, Gent, Belgium*; [2]*VIB Inflammation Research Center, Gent, Belgium*; [3]*Ghent University Hospital, Nuclear Medicine, Gent, Belgium*

Background: Currently MRI is the preferred imaging method to detect bone marrow edema (BME), the hallmark of sacroiliitis. MRI plays an important role in the early diagnosis of axial Spondyloarthritis (axSpA). Biological disease-modifying anti-rheumatic treatment has revolutionized the therapeutic armamentarium of axSpA. With drugs targeting TNFα, 50% of axSpA patients achieve a clinically important response. Therefore, we hypothesized that if we would be able to demonstrate in vivo expression of TNFα in sacroiliac joints by scintigraphy with 99mTc-radiolabeled certolizumab pegol (99mTc-CZP), this might lead to more 'evidence-based biological therapy'.

Objectives: To investigate the agreement between BME on MRI-SIJ and tracer uptake on immunoscintigraphy with 99mTc- CZP in the same location in patients with axSpA.

Methods: CZP was conjugated with S-HYNIC and subsequently radiolabeled with approximately 740 MBq Tc99m and injected intravenously. Static images with single photon emission tomography (SPECT)/computed tomography (CT) of SIJ were acquired 4-6h post injection. Uptake of the tracer was scored semi-quantitatively, per quadrant of the SIJ: 0=no uptake, 1=faint uptake or 2=clear uptake. BME on MRI was scored per quadrant over 6 slices as absent or present, providing a maximum score of 6 per quadrant. Agreement between MRI-SIJ and immunoscintigraphy was calculated (kappa; percentage agreement) for all quadrants separately. To calculate the agreement a cut-off of ≥1 was used for MRI scores as well as immunoscintigraphy scores. In addition, depth and intensity of BME lesions on MRI-SIJ (as defined in the Spondyloarthritis Research Consortium of Canada (SPARCC) method) were assessed per slice per SIJ.

Results: 7 axSpA patients (mean age 36±5.7 years) had both MRI-SIJ and immunoscintigraphy available. The mean score for BME lesions seen on MRI was 12.9±13.2 and 4.86±5.4 for tracer uptake observed on the immunoscintigraphy. In 2 out of the 7 patients there was no BME on MRI and in the same 2 patients there was no tracer uptake seen on scintigraphy. In table 1 kappa coefficients and percentage agreement for every quadrant are shown. The mean and median of agreement for all quadrants was k=0.80 and k=0.86, respectively. Clear tracer uptake (score 2) was correlated to deep BME lesions on MRI-SIJ (extending over the depth of at least 1cm from the articular surface); the observed Spearman's rho correlations were 0.986 (p<0.00) and 0.956 (p<0.00) for left and right SIJs, respectively. Regarding intensity, no significant correlation with clear tracer uptake was found. Interestingly, in one additional patient with complete ankylosis of the SIJs on radiographs no tracer uptake could be detected, suggesting that in vivo detection of TNF does not correlate with bone formation.

Table 1. Agreement on presence of BME on MRI-SIJ in a quadrant and tracer uptake on the immunoscintigraphy in that same quadrant.

Location of the SIJ quadrant	Kappa (CI)	Percentage agreement
Right upper iliac quadrant (RQ1)	0.720 (0.21-1)	85.7%
Right upper sacral quadrant (RQ2)	0.696 (0.14-1)	85.7%
Right lower sacral quadrant (RQ3)	0.417 (0-1)	71.4%
Right lower iliac quadrant (RQ4)	1 (1-1)	100%
Left upper iliac quadrant (LQ1)	1 (1-1)	100%
Left upper sacral quadrant (LQ2)	0.588 (0-1)	85.7%
Left lower sacral quadrant (LQ3)	1 (1-1)	100%
Left lower iliac quadrant (LQ4)	1 (1-1)	100%

Conclusion: Inflammation on MRI-SIJ can be detected with immunoscintigraphy with 99mTc-CZP. The immunoscintigraphy showed good correlation with BME lesions on MRI in patients with axSpA. Deep lesions, considered specific for axSpA, showed an almost perfect correlation.

Disclosure of Interests: : Philippe Carron: None declared, Manouk de Hooge: None declared, Thomas Renson: None declared, Bieke Lambert: None declared, Kathia De Man: None declared, Dirk Elewaut: None declared, Filip van den Bosch Consultant for: AbbVie, BMS, Galapagos, Janssen, Lilly, Merck, Novartis, Pfizer and UCB, Speakers bureau: AbbVie, BMS, Janssen, Lilly, Merck, Novartis, Pfizer and UCB.
DOI: 10.1136/annrheumdis-2019-eular.6926

SAT0526 THE COURSE OF ABERRANT FINDINGS ON MRI OF THE SACROILIAC JOINTS OVER 6 MONTHS IN POSTPARTUM WOMEN

Anaïs Depicker[1], Thomas Renson[1,2], Ann-Sophie De Craemer[1,2], Manouk de Hooge[1,2], Liselotte Deroo[1,2], Gaëlle Varkas[1], Nele Herregods[3], Lennart Jans[3], Kristien Roelens[4], Isabelle Dehaene[4], Philippe Carron[1,2], Dirk Elewaut[1,2], Filip van den Bosch[1,2]. [1]*Ghent University Hospital, Rheumatology, Ghent, Belgium*; [2]*Ghent University, VIB Inflammation Research Center, Ghent, Belgium*; [3]*Ghent University Hospital, Radiology, Ghent, Belgium*; [4]*Ghent University Hospital, Obstetrics, Ghent, Belgium*

Background: Sacroiliac bone marrow oedema (BME) on magnetic resonance imaging (MRI) can have different causes. Besides spondyloarthritis (SpA), other more rare causes as stress fractures, mechanical stress, infections or malignancies can be identified. There are limited data regarding the specificity of MRI lesions in a non-SpA population. Pregnancy and vaginal delivery might induce the presence of inflammatory and/or structural MRI lesions by mechanical stress.

Objectives: To assess aberrant findings on MRI features of the sacroiliac joints (SIJ) in postpartum women and describe the course after a 6 month time period.

Methods: Twenty-five women underwent an MRI of the SIJ within 10 days after childbirth; delivery by caesarean section was excluded. The scan was repeated after 6 months. One subject was lost to follow-up. Three trained readers systematically scored inflammatory and structural SpA-like lesions (not reported here) and qualitatively described other aberrant findings. Both time points were scored on T1-weighted and short tau inversion recovery (STIR) MRI images. Readers were blinded for time sequence and clinical and demographic information on the subjects.

Results: In 16 out of 25 (64%) subjects there were aberrant MRI findings at baseline. Thirteen out of 25 (52%) showed BME at the symphysis pubis on the baseline MRI (fig. 1). After 6 months, 6 out of 24 (25%) subjects still showed BME; in 1 subject BME of the symphysis pubis was increased at 6 months. Two out of 25 (8%) displayed a sacral fracture on the baseline MRI. Both these fractures were asymptomatic and resolved completely after 6 months (fig. 2). One out of 25 subjects (4%) showed degenerative disc disease at level L5-S1 in the form of Modic type 2; vertebral and endplate related replacement of bone marrow with fat deposition. As expected, the presence of Modic type 2 did not decrease at follow-up. No other aberrant findings were seen.

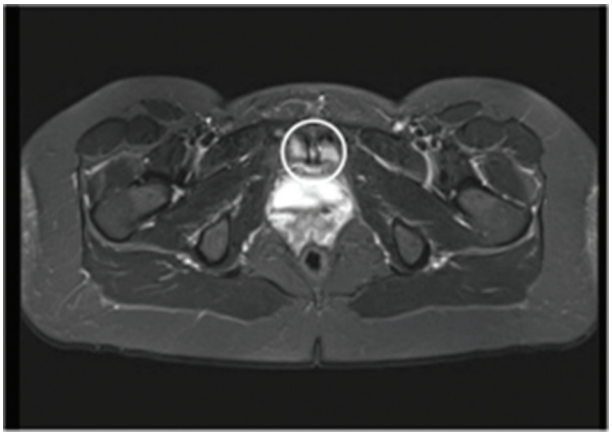

Figure 1. BME of the symphysis pubis on STIR sequence.

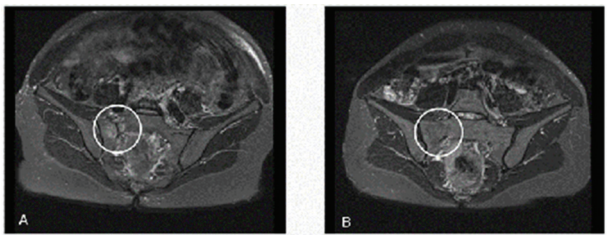

Figure 2. STIR image of sacral fracture at baseline (**A**) and after 6 months ***(B)***.

Conclusion: Aberrant findings, like sacral fractures and degenerative disc disease, are observed when assessing MRI-SIJ of postpartum women for SpA-like lesions. BME at the symphysis pubis was often seen shortly after birth and half of those lesions persisted at follow-up after 6 months.
Disclosure of Interests: : Anaïs Depicker: None declared, Thomas Renson: None declared, Ann-Sophie De Craemer: None declared, Manouk de Hooge: None declared, Liselotte Deroo: None declared, Gaëlle Varkas: None declared, Nele Herregods: None declared, Lennart Jans: None declared, Kristien Roelens: None declared, Isabelle Dehaene: None declared, Philippe Carron: None declared, Dirk Elewaut: None declared, Filip van den Bosch Consultant for: AbbVie, BMS, Galapagos, Janssen, Lilly, Merck, Novartis, Pfizer and UCB, Speakers bureau: AbbVie, BMS, Janssen, Lilly, Merck, Novartis, Pfizer and UCB.
DOI: 10.1136/annrheumdis-2019-eular.4854

SAT0527 DOPPLER IN ENTHESES: A POTENTIAL USEFUL OUTCOME IN ACTIVE SPONDYLOARTHRITIS AND PSORIATIC ARTHRITIS

Juan Molina Collada[1], Cristina Macía-Villa[2], Chamaida Plasencia[1], Diana Peiteado[1], Laura Nuño[1], Irene Monjo[1], Alejandro Villalva[1], Carolina Tornero[1], Patricia Bogas[1], Luis Coronel[3], Gabriela González[1], Diego Benavent[1], Elisa Fernández[1], Pablo Rodríguez-Merlos[1], Gerardo Napky[1], Alejandro Balsa[1], Eugenio de Miguel[1]. *[1]Hospital Universitario La Paz, Madrid, Spain*; *[2]Hospital Universitario Severo Ochoa, Madrid, Spain*; *[3]Hospital Universitario Nuestra Señora de la Candelaria, Tenerife, Spain*

Background: The assessment of activity in spondyloarthritis (SpA) and psoriatic arthritis (PsA) involves several domains, including entheses. Clinical enthesitis has shown low sensitivity, specificity and reliability. The inclusion of ultrasound (US) could be an objective outcome in the assessment of the disease.
Objectives: To assess the prevalence of peripheral US enthesitis using an US score, at patient level, among active SpA and PsA patients.
Methods: A cross-sectional study in patients with SpA and PsA active disease (defined as patients proposed to start or switch biological therapy according to physician criteria and in agreement with clinical guidelines) was undertaken. Basal assessment included clinical features, physical examination and laboratory tests. Patients underwent bilateral US examination of peripheral entheses according to the MAdrid Sonographic Enthesitis Index (MASEI). MASEI and OMERACT enthesitis Power Doppler (PD) definitions were checked. Each enthesis was scanned in both the longitudinal and transverse planes, and 5 second videos were recorded for reliability. An inter-reader analysis by three readers was performed. For statistical analysis Mann-Whitney U test, Kruskal-Wallis test and intraclass correlation coefficients (ICCs) were used.
Results: 36 patients were included, of whom 19(52.8%) were ankylosing spondylitis (AS) patients, 10(27.8%) PsA, and 7(19.4%) non radiographic axial spondyloarthritis (nr-axSpA). Mean age was 49.8±13.1 years and 18 (50%) were females. Mean DAS28 (3.5±1.3), ASDAS (3.7±0.9), BASDAI (5.7±2.2) and CRP values (11.5±12.6) reflect moderate-high disease activity. Demographic and clinical baseline characteristics are shown in Table 1. Mean global MASEI score was 28.1(±9.1) and 30 patients (83.3%) scored ≥18 (proposed cut-off point to diagnose SpA). Abnormal US findings consistent with at least one enthesis showing PD signal (whether using MASEI or OMERACT PD definition) were observed in 29(80.6%) of patients while two or more PD in entheses were observed in 21(58.3%) patients (PD MASEI definition) or 18(50%) patients (PD OMERACT definition), without significant variation among the different SpA subtypes. The inter-reader reliability among the three readers was high (mean ICC of 0.85). Table 2 shows the ICC of every reader pair.
Conclusion: Presence of PD enthesitis is found in 80% of patients with active SpA and PsA. This finding is independent of SpA subtype and support the usefulness of PD US in the assessment of enthesitis.

Table 1. Baseline characteristics of active SpA patients

		Total n= 36	AS n=19 (52.8%)	PsA n=10 (27.8%)	nr-axSpA n=7 (19.4%)	p
Age		49.8±13	50.3±14.5	51.1±12.9	46.3±9.9	0.7
Sex	Female	18 (50%)	9 (47.4%)	5 (50%)	4 (57.1%)	0.9
CRP (mg/L)		11.5 ±12.6	13.7±11.4	11±17	6.8±9.1	0.4
DAS28 n= 22		3.5±1.3	3.1±1.1	4±1.4	3.2±1.4	0.4
ASDAS n= 17		3.7±0.9	3.7±1	4.1±0.6	3.5±0.6	0.5
BASDAI n=24		5.7±2.2	5.3±2.5	5.4±0.8	7.1±1	0.2
MASEI score ≥18		30 (83.3%)	18 (94.7%)	7(70%)	5(71.4%)	0.2
Mean number of enthesis with PD OMERACT		1.7±1.3	1.7±1.3	1.7±1.3	1.6±1.7	0.9
Mean number of enthesis with PD MASEI		1.8±1.4	1.9±1.4	1.8±1.2	1.7±1.7	0.9
PD OMERACT	≥1	29 (80.6%)	15 (78.9%)	9 (90%)	5(71.4%)	0.8
	≥2	18 (50%)	11 (57.9%)	4 (40%)	3 (42.9%)	0.6
PD MASEI	≥1	29 (80.6%)	15 (78.9%)	9 (90%)	5(71.4%)	0.8
	≥2	21 (58.3%)	12 (63.2%)	5 (50%)	4 (57.1%)	0.8

Table 2. Inter-reader reliability

	Reader 1	Reader 2	Reader 3
ICC reader 1		0.784 (95% CI 0.58 to 0.89)	0.909 (95% CI 0.82 to 0.95)
ICC reader 2	0.784 (95% CI 0.58 to 0.89)		0.855 (95% CI 0.72 to 0.93)
ICC reader 3	0.909 (95% CI 0.82 to 0.95)	0.855 (95% CI 0.72 to 0.93)	

Disclosure of Interests: Juan Molina Collada: None declared, Cristina Macía-Villa: None declared, Chamaida Plasencia Speakers bureau: Pfizer, MSD, Diana Peiteado: None declared, Laura Nuño: None declared, Irene Monjo: None declared, Alejandro Villalva: None declared, Carolina Tornero: None declared, Patricia Bogas Grant/research support from: non restricted grant from Sanofi, Luis Coronel: None declared, Gabriela González: None declared, Diego Benavent: None declared, Elisa Fernández: None declared, Pablo Rodríguez-Merlos: None declared, Gerardo Napky: None declared, Alejandro Balsa Grant/research support from: Abbvie, Pfizer, Novartis, BMS, Nordic, Sanofi, Consultant for: Abbvie, Pfizer, Novartis, BMS, Nordic, Sanofi, Sandoz, Lilly, Paid instructor for: Pfizer, Speakers bureau: Pfizer, Novartis, UCB, Nordic, Sanofi, Sandoz, Lilly, Eugenio de Miguel: None declared
DOI: 10.1136/annrheumdis-2019-eular.3384

SAT0528 DETECTION OF FACET JOINT ANKYLOSIS ON WHOLE SPINE LOW-DOSE CT IN RADIOGRAPHIC AXIAL SPONDYLOARTHRITIS: DATA FROM THE SENSITIVE IMAGING OF AXIAL SPONDYLOARTHRITIS (SIAS) COHORT

Rosalinde Stal[1], Floris A. van Gaalen[1], Alexandre Sepriano[1], Juergen Braun[2], Monique Reijnierse[1], Désirée van der Heijde[1], Xenofon Baraliakos[2]. *[1]LUMC, Leiden, Netherlands*; *[2]Rheumazentrum Ruhrgebiet, Herne, Germany*

Background: In radiographic axial spondyloarthritis (r-axSpA), whole spine low-dose CT (ldCT) is superior in detecting syndesmophytes to conventional radiography (CR), which is limited to the lumbar and cervical spine. As facet joints are difficult to visualize on CR, CT has been used to study facet joint ankylosis in r-axSpA in parts of the spine. However, facet joints in the whole spine have never been studied.
Objectives: To assess visibility and interreader reliability of facet joint ankylosis as detected by whole spine ldCT and to describe the prevalence of facet joint ankylosis in patients with r-axSpA.
Methods: In an observational cohort, 60 r-axSpA patients with 1-18 syndesmophytes on CR and at least one inflammatory lesion on spinal MRI, underwent ldCT (approximately 4 mSV) of the whole spine. Images were assessed independently by two trained readers and left and right C2-C3 to L5-S1 facet joints were scored as ankylosis present (1) or absent (0). The percentages of missing joint scores per reader were calculated.