Diagnostics and imaging procedures

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

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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 TNF α , 50% of axSpA patients achieve a clinically important response. Therefore, we hypothesized that if we would be able to demonstrate in vivo expression of TNF α 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 $\pm$ 5.7 years) had both MRI-SIJ and immunoscintigraphy available. The mean score for BME lesions seen on MRI was 12.9 $\pm$ 13.2 and 4.86 $\pm$ 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.

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

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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.