include Larsen score for radiographs, RAMRIS for magnetic resonance imaging (MRI) and EULAR-OMERACT score for ultrasound (US). However, pairwise correlations between all three imaging modalities and their correlations with synovial histopathological assessment have not been performed.

**Objectives:** To investigate the relationship between histological synovitis and radiological synovitis, assessed by conventional X-ray, US and MR of the wrist radio-carpal joint.

**Methods:** Forty patients, 20 with treatment naive early RA (ERA) and 20 with longstanding RA (LRA), were enrolled in a 6 month prospective study. RA patients underwent US guided synovial biopsy (USGB) of the wrist at enrollment and after 6 months. Imaging was conducted on the same hand as biopsied. MRI was performed at baseline for all, and also at 6 months for the ERA group, and scored with the RAMRIS system. Wrist X-ray was scored by Larsen score at baseline and after 6 months. Hand US examination at baseline, 3 and 6 months was scored by the EULAR-OMERACT US system. Synovial biopsy inflammation at baseline and 6 months was determined by the Krenn score, scores for CD20, CD3, CD138, CD68 staining, and classification of synovial pathotypes.

**Results:** In the ERA group at baseline, Krenn score was strongly correlated with both EULAR-OMERACT US combined score (r = 0.77 p < 0.001) and RAMRIS MRI synovitis score (r = 0.85 p < 0.001), while uncorrelated at 6 months (r = 0.18, p = 0.38 and r = 0.14, p = 0.65). In the LRA group at baseline, these scores correlated strongly (r = 0.83, p < 0.001) to moderately (r = 0.61, p = 0.002), and persisted at 6 months for US score (r = 0.81 p < 0.001). Larsen score was not correlated with Krenn score at any point in any group. For all RA patients, change in Krenn score between baseline and 6-month biopsy, was correlated with both change in EULAR-OMERACT US combined score (r = 0.65, p < 0.001) and change RAMRIS MRI synovitis score (r = 0.50, p = 0.03), but not to change in Larsen score. Patients with the lymphoid pathotype had higher US combined score, MRI synovitis score and Krenn score at baseline compared to other pathotypes (all p < 0.05).

**Conclusion:** The MRI RAMRIS synovitis score and EULAR-OMERACT US scoring system are sensitive measures of histological synovitis in LRA and ERA. After 6 months, this correlation persists in the established RA group despite effective treatment, but not in the ERA group. This suggests that ERA and LRA may have different responses to treatment intensification, possibly due to an immunological “window of opportunity” in the ERA group. Overall, significant fall in MRI/US synovitis are associated with significant fall in histological synovitis. These findings validate the use of MRI RAMRIS and EULAR-OMERACT US scores as surrogate markers of histological synovitis in established RA and early untreated RA. Synovial pathotypes have differences at baseline in degree of synovial inflammation and US and MRI imaging scores.

**Disclosure of Interests:** None declared

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