Intra-reader reproducibility was poor for all three groups: RA (ICC=0.37; 95%CI: -0.09-0.29) and poor for HC (ICC=0.28; 0.07-0.47).

Repeatability was moderate for RA (ICC=0.68; 95%CI: 0.45-0.83), poor for PsA (ICC=0.19, 95%CI: -0.04, 0.19) and poor for HC (ICC=0.28; 0.07, 0.47).

Variable RA PsA HC
---
Age (years) 51 (31-56) 48 (46-52) 35 (30-40)
Female, n, (%) 7 (77.8%) 9 (69%) 8 (53.33%)
Symptom duration (years) 6 (3.5-17.5) 10 (4-20.5) -
Peripheral pain (0-100 VAS) 34 (30.5-57) 32 (10-65) 0 (0-1.5)
Peripheral patient global (0-100 VAS) 50 (23-60) 48 (15-76) 0 (0-0.75)
Number of swollen joints (0-78) 6 (4.7-5) 4 (3-8) 0 (0-0)
Number of tender enchese (0-31) 4 (0-8.5) 9 (1-13.5) 0 (0-2)
Serum C-reactive protein (mg/dl) 5 (1.5-7) 5 (1.5-7) 6 (4.25-8)

Table 1. Comparative analysis between the thermal and ultrasound imaging parameters

<table>
<thead>
<tr>
<th>Thermal imaging parameter</th>
<th>Pearson’s correlation vs. GS score</th>
<th>P-value</th>
<th>Correlation coefficient (95% CI) vs. PD score</th>
<th>P-value</th>
<th>Estimates (95% CI) vs. GS score</th>
<th>P-value</th>
<th>Estimates (95% CI) vs. PD score</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX</td>
<td>0.40</td>
<td>0.029*</td>
<td>0.47</td>
<td>0.030*</td>
<td>0.11</td>
<td>0.009**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVG</td>
<td>0.42</td>
<td>0.020*</td>
<td>0.43</td>
<td>0.017*</td>
<td>0.060**</td>
<td>0.018*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIN</td>
<td>0.39</td>
<td>0.032*</td>
<td>0.40</td>
<td>0.028*</td>
<td>0.093*</td>
<td>0.029*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Participant characteristics. RA, rheumatoid arthritis; PsA, psoriatic arthritis; HC, healthy control; VAS visual analogue scale. Values are median (range), if not otherwise indicated.

REFERENCES:
NIL.

Disclosure of Interests: None Declared.

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AB1546 GRADING SYNOVITIS IN WRIST AND HAND USING THE MRI DERIVED APPARENT DIFFUSION COEFFICIENT FAILS TO SHOW RELIABILITY AND REPRODUCIBILITY

Keywords: Imaging, Validation

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Background: Diffusion-weighted (DWI) magnetic resonance imaging (MRI) of the hand and wrist has been suggested as an outcome measure of synovitis as an alternative to gadolinium enhanced MRI in patients with rheumatoid arthritis (RA) [1-2]. The apparent diffusion coefficient (ADC), which is a derived parameter from the DWI, may be used to grade synovitis, similar to the OMERACT Rheumatoid Arthritis MRI scoring system (RAMRIS) for synovitis [1]. In a small study criterion validity has been measured but no correlation to contrast-enhanced MRI was revealed [2].

Objectives: To test the discriminative validity of ADC in the synovium (“synovitis ADC”) in a prospective cohort of patients with RA and psoriatic arthritis (PsA) and healthy controls (HC).

Methods: The right hand and wrist of all participants were imaged in a 3T MRI system with a dedicated 8 channels coil, applying a 2 mm thick coronal turbo spin echo DWI sequence with an in-plane resolution of 1.5x1.7mm. An ADC map was calculated on basis of two b-values (0;800). Assessment of ADC maps was performed in 7 regions of interest according to the same 7 areas which are assessed by the OMERACT RAMRIS (radioulnar-, radiocarpal-, and intercarpal-carpometacarpal-joint). Repeatability and intra-observer reproducibility were assessed using intraclass correlation coefficients (ICCs) and Bland-Altman plots.

Results: Thirty-eight participants were imaged twice within a week (median 7 days, range 3-14 days). Participant characteristics are provided in Table 1. The repeatability was moderate for RA (ICC=0.68; 95%CI: 0.45-0.83), poor for PsA (ICC=0.19; 95%CI: -0.04, 0.19) and poor for HC (ICC=0.28; 95%CI: 0.07-0.47). Intra-reader reproducibility was poor for all three groups: RA (ICC=0.37; 95%CI: 0.12-0.58), PsA (ICC=0.22; 95%CI: 0.02-0.40) and HC (ICC=0.34; 95%CI: 0.13-0.52). Bland-Altman plots revealed large absolute differences between 1st and 2nd MRI in all three groups of participants (Figure 1).

REFERENCES:

Conclusion: ADC, determined from DWI-MRI, is not a reliable outcome measure for grading synovitis in the hand and wrist of patients with inflammatory joint diseases.
Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>RA</th>
<th>PsA</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>51 (31-56)</td>
<td>48 (46-52)</td>
<td>35 (30-40)</td>
</tr>
<tr>
<td>Females, n (%)</td>
<td>7 (77%)</td>
<td>9 (69%)</td>
<td>8 (53.3%)</td>
</tr>
<tr>
<td>Symptom duration (years)</td>
<td>6 (3.5-17.5)</td>
<td>10 (4-20.5)</td>
<td>-</td>
</tr>
<tr>
<td>Peripheral pain (0-100 mm VAS)</td>
<td>34 (30.5-57)</td>
<td>32 (10-65)</td>
<td>0 (0-1.5)</td>
</tr>
<tr>
<td>Peripheral patient global (0-100 mm VAS)</td>
<td>50 (23-60)</td>
<td>48 (15-76)</td>
<td>0 (0-0.75)</td>
</tr>
<tr>
<td>Number of swollen joints (0-76)</td>
<td>6 (4-7.5)</td>
<td>4 (3-8)</td>
<td>0 (0-0)</td>
</tr>
<tr>
<td>Number of tender joints (0-78)</td>
<td>8 (3.5-16)</td>
<td>10 (5-18)</td>
<td>0 (0-0)</td>
</tr>
<tr>
<td>Number of tender entheses (0-31)</td>
<td>4 (0-8.5)</td>
<td>9 (1-13.5)</td>
<td>0 (0-2)</td>
</tr>
<tr>
<td>Serum C-reactive protein (mg/dl)</td>
<td>5 (1.5-7)</td>
<td>5 (1.5-7)</td>
<td>6 (4.25-8)</td>
</tr>
</tbody>
</table>

Table: Participant characteristics. RA, rheumatoid arthritis; PsA, psoriatic arthritis; HC, healthy control; VAS visual analogue scale. Values are median (range), if not otherwise indicated.

**AB1547 SHEAR-WAVE ELASTOGRAPHIC ULTRASOUND OF SECOND METACARPOPHALANGEAL IN SYNOVIAUM OF RHEUMATOID ARTHRITIS**

**Keywords:** Diagnostic tests

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**Background:** Shear wave elastography (SWE) is a recent development in elastography ultrasound (SW-EUS). SWE allows quantitative evaluation of the elastic properties and stiffness of tissue and serves as an adjunct to conventional US techniques. There is a hypothesis that rheumatoid arthritis (RA) patients would have softer synovium than controls and this could be quantified with a slower SWV. We also assessed whether SWV varied with disease activity. The challenge in the application of SW-EUS to the synovium is that there are multiple bone tissue interfaces and fluid synovial interfaces in the joint which gave rise to increased chances of fallacious values.

**Objectives:** To perform a quantitative analysis of SW-EUS in second metacarpophalangeal (2MCP) synovium of RA patients and controls. Determine if there is a correlation between SW-EUS and disease activity.

**Methods:** A prospective case-control study. Fifteen patients with RA were consecutively recruited and matched with ten controls. Participants underwent clinical assessment, blood sampling, gray scale ultrasound (GSUS), power Doppler ultrasound and SW-EUS of MCP joints 2, on the dominant hand. Ultrasound examination was undertaken by two musculoskeletal trained sonographers. Both were blinded to patient diagnosis, clinical examination results, pathology and previous ultrasound findings. SW-EUS was performed first, followed by GSUS and PDUS. Scanning was carried out using ultrasound using linear array transducer at 6-18 mHz frequency and Virtual TouchTM software. MCP 2 of the dominant hand were scanned with joints resting at 20 degrees of flexion. The dorsal aspect of the joint was imaged in three planes; longitudinal midline (DLM), longitudinal radial (30° radial offset from midline, DLR) and longitudinal ulnar (30% ulnar offset from midline, DLU).

**Results:** Average age was 50. Mean RA disease activity (DAS28-ESR) was moderate at 3.85. Patients with RA (Figure 1) had lower mean SWV (5.27 m/s) vs. 12.80 m/s (p < 0.001) than controls (2.59 m/s vs. 12.80 m/s, p = 0.085). Mean SWV and elastic modulus was significantly lower in RA than controls. There was a negative correlation between mean and maximum SWV and GSUS synovial thickening and assessing disease activity in RA. Further study is warranted to confirm the role of SW-EUS in diagnosing and assessing disease activity in RA.

**REFERENCES:**

**Acknowledgements:** NIL.

**Disclosure of Interests:** None Declared.

**doi:** 10.1136/annrheumdis-2023-eular.1211

**AB1548 ULTRASOUND ASSESSMENT OF SUB-CLINICAL NAIL INVOLVEMENT IN PSORIATIC ARTHRITIS PATIENTS**

**Keywords:** Ultrasound, Psoriatic arthritis, Enthesitis

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**Background:** Several studies suggest that psoriatic nail involvement is secondary to local enthesopathy with diffusion of the inflammation to the nail. We aimed to compare parameters of clinically normal nail unit in patients affected by psoriatic arthritis (PsA) with healthy matched controls (HC) using ultrasonography.

**Methods:** This was a cross-sectional study including patients with PsA and HC. Tender joint count (TJC) (0-68) and swollen joint count (SJC) (0-66) were collected and psoriasis Area and Severity Index (PASI), Disease Activity in Psoriatic Arthritis (DAPSA), were calculated in PsA patients. All patients underwent ultrasound (US) assessment of the fingernails including the study of morphological changes and measurement of the thickness of nail bed (NBT), nail plate (NPT), and adjacent skin (ST). Significant difference was noted if p<0.05.

**Results:** A total of 22 PsA patients (219 nails) and 21 matched HC (210 nails) were evaluated. PsA group and HC were comparable with respect to age (53.7±12.1 vs 53±11.8, p=0.72) and male gender (13 vs 13, p=0.85). Mean disease duration of PsA was 12.7±10.9 years. The disease activity showed that mean DAPSA was 21.56±14.36 and mean PASI was 2.19 ± 3.8. PsA patients had more US morphological changes than HC group (16.89% vs 3.33%,p=0.03). The comparison of NPT between each identical fingernail of PsA and HC did not reveal significant difference. However, NBT was significantly higher in the HC group than the PsA group (1.77mm vs 2.07mm, p=0.027). Additionally, ST was higher in the HC group (2.26mm vs 2.59mm, p=0.003).

**Conclusion:** The US morphological changes of NBT and ST were contributive to distinguish psoriatic nails from healthy nails.