Results: 437 RA patients were included in the current analysis; 71% women, 79% anti-CCP pos, 71% RF pos, median(IQR) age 54(42-62) years, CRP 7(3-16), SJC28 5(3-26) and TJC28 6(2-28). The median (IQR) PD sum score was 3(0-7) for right hand and 2(0-5) for left hand, GS sum score was 5(2-9) for both hands, and GLOESS was 5(2-10) for right hand and 5(2-9) for left hand. The average ultrasound measured inflammation at baseline and 3 months follow-up are shown in the table. The hands with more vs fewer SwJ had more inflammation at baseline for all sum scores, all $p < .0001$) and had a greater change for all sum scores at 3 months follow-up (all $p < 0.0005$). No such differences were found between the dominant vs non-dominant or the right vs left hands at any time points – see table. **Conclusion:** Based on this study, assessment of the dominant hand is not superior to the non-dominant hand in inflammatory activity evaluated by US. The hand with clinically more SwJ at baseline is likely to have more active inflammation according to GS, Doppler and GLOESS sum scores and exhibit a greater change, and is potentially the best choice for unilateral US scoring systems.

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FRI0626

DIFFICULTIES WITH MAKING A FIST IN PATIENTS WITH CLINICALLY SUSPECT ARTHRALGIA; AN EARLY PHENOMENON PREDICTIVE FOR RA THAT IS RELATED TO MRI-DETECTED TENOSYNOVITIS

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Background: Difficulties with making a fist in patients presenting with recent-onset arthralgia of small joints, in whom there is no clinically detectable arthritis, is often considered a risk factor for the development of inflammatory arthritis. The fact that rheumatologists consider difficulties with making a fist a feature of imminent Rheumatoid Arthritis (RA) is also reflected by this sign being incorporated in the EULAR definition of arthralgia suspicious for progression to RA. However, to date there is little comprehension on its predictive value and underlying cause in patients with recent-onset arthralgia.

Objectives: This study was performed to 1) determine if difficulties making a fist is indeed predictive for the development of clinical arthritis, and 2) evaluate if this sign is associated with subclinical joint inflammation, detected by magnetic resonance imaging (MRI).

Methods: 566 patients presenting with recent-onset (<1 year) arthralgia of small joints that were consecutively included in the Clinically Suspect Arthralgia (CSA) cohort were studied. At baseline the ability to completely close the fist (all fingertips touching the palm) was assessed at physical examination. Additionally, contrast-enhanced 1.5T MRI of wrist, 2nd-5th metacarpophalangeal (MCP) and 1st-5th metatarsophalangeal (MTP) joints was performed. MRIs were scored for synovitis, bone marrow edema (BME) and tenosynovitis in line with the RAMRIS. MRI-detected subclinical inflammation was considered present if it was more than observed in symptom-free controls from the general population in the same age-category (n=193). Patients were followed on the development of clinically detectable inflammatory arthritis identified at joint examination (median

follow-up 19 months); none of the patients received DMARDs before the development of clinical arthritis. χ^2 tests, logistic and Cox proportional hazards regression were used as appropriate.

Results: At first presentation 12% of CSA-patients had difficulties making a fist with one or both hands. Having difficulties making a fist was predictive for development of clinical arthritis in univariable analysis (HR 2.47 (95% CI 1.46-4.19)) and in multivariable analysis (HR 2.16 (1.25-3.74) corrected for age, CRP, ACPA and MRI-detected subclinical inflammation). Patients with difficulties making a fist had significantly more often MCP tenosynovitis (flexor tenosynovitis and extensor peritendinitis combined) than patients who did not experience these problems (42% versus 16%, $p < 0.001$). The main difference was seen in MCP flexor tenosynovitis (39% versus 10%, $p < 0.001$). MCP flexor tenosynovitis was significantly associated with difficulties making a fist in univariable (OR 5.6 (95% CI 3.2-9.9)), and multivariable regression (OR 5.7 (3.2-10.2) corrected for extensor peritendinitis, synovitis and BME in MCP joints). Extensor peritendinitis, synovitis and BME in MCP joints were not associated with difficulties making a fist (multivariable OR 0.7 (0.2-2.1), 0.99 (0.5-2.1) and 1.6 (0.7-4.1), respectively).

Conclusion: Difficulties making a fist in patients with CSA is predictive for future inflammatory arthritis development. This sign is presumably caused by MCP flexor tenosynovitis in a significant proportion of patients.

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FRI0627

DOES ADDING AN US EXAMINATION OF SHOULDERS, TO A ROUTINE DAS-28 SCORE, IMPROVE ACCURACY OF DISEASE ACTIVITY SCORES AND DISEASE STATUS? RESULTS OF A SINGLE CENTRE PILOT STUDY

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Background: The DAS28 forms the mainstay of current RA and other chronic inflammatory arthritis (CIA) [i.e. peripheral spondyloarthritis (SpA)] management in clinical practice. DAS28 has certain limitations. Some joints especially the shoulders are difficult to evaluate correctly using this method. The shoulder is deep and highly affected by rotator cuff tendon lesions either due to degenerative or inflammatory arthritis. This structural damage can produce pain and swelling. A swollen shoulder joint can be difficult to palpate by physical examination. Using a clinical approach can be inaccurate to ascertain whether shoulder involvement is actually due to true RA-derived inflammatory activity or other degenerative or structural causes.

Objectives: To investigate the added value of adding a US assessment of shoulders to DAS28 scores and on disease activity status, in patients with CIA (RA or peripheral SpA) in either disease remission or low disease states who had shoulder pain.

Methods: Patients were recruited prospectively over a 3-month period. Each patient had a standard DAS28 performed followed by a formal physical shoulder examination, of both shoulders, including testing active and passive range of movements. A complete US examination of both shoulders was carried out by a rheumatologist experienced in this technique. All patients were examined using the same real-time US machine (Esaote MyLab Twice) using a linear probe, 3-13 MHz frequency and 57% gain. The original DAS28 was recalculated (i.e. US-modified DAS28) according to the presence/absence of inflammatory findings on shoulder US.

Results: Thirty-eight patients [82% females; mean ($\pm$ SD) age 60.3 (11.96) years] were included. In 33 out of 38 (87% [CI95%: 76-98%]) patients the original DAS28 was greater than the US-modified DAS28. This percentage was significantly greater than 50% ($p < 0.001$). The mean $\pm$ SD reduction of DAS28 in those patients who showed DAS28 decrease was 0.73 ± 0.39 units. Twenty-five patients (65.8%) maintained the same disease activity status with original DAS28 and US-modified

DAS28. The remaining 13 (34.2%) patients changed their status: 11 (28.9%) patients moved from low activity to remission while 2 (5.3%) patients moved from low activity to moderate activity. Figure 1 and 2 demonstrate some of the ultrasound findings observed in our patient group.

Figure 1-. Biceps tenosynovitis in a. transverse and b. longitudinal views.

Figure 2-. Subacromial-subdeltoid (SASD) bursitis in a. transverse and b. longitudinal views.

Conclusion: This study showed that patients improved their disease activity scores and status after an US assessment of their shoulders. A low percentage increased their disease status after shoulder US which can be also important for local or systemic therapeutic decisions. Based on this study, we suggest that shoulder US can provide valuable additional information to the DAS28 when evaluating disease activity in CIA patients.

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FRI0628

DIAGNOSTIC VALUE OF OPTICAL SPECTRAL TRANSMISSION IN PATIENTS WITH RHEUMATOID ARTHRITIS: CORRELATIONS WITH DISEASE ACTIVITY, EPIDEMIOLOGIC AND ANTHROPOMETRIC PARAMETERS

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Background: Valid assessment of disease activity leads to improvement of long-term outcomes in patients with rheumatoid arthritis (RA) (1). Clinical disease activity assessment tools such as the Disease Activity Score

28 (DAS28) are partially subjective and do not always depict the real inflammatory burden. Ultrasound (US) and Hand-MRI are important diagnostic modalities which can nevertheless be time consuming (US, MRI), expensive (MRI) or usually performed unilaterally (MRI). Thus, further diagnostic tools are needed. Optical spectral transmission (OST) is a new modality able to assess the blood-specific absorption of light transmitted through a tissue promising quantification of inflammation in the finger and wrist joints of RA patients (commercial device: HandScan - Hemics, The Netherlands)(2).

Objectives: To examine the diagnostic value of OST in detecting inflammation in patients with RA and to evaluate for the first time its relationship with disease activity markers and various anthropometric and epidemiologic patient characteristics.

Methods: OST-Measurements were performed in 168 RA-patients and 114 healthy controls. The difference between OST in the two groups was statistically examined and subsequently controlled for the effect of possible confounding factors. Moreover, association of OST with clinical, ultrasound and serological RA activity markers was evaluated. Finally, relationship of OST with radiographic joint pathology and various anthropometric and epidemiologic parameters (BMI, hand-size, gender, age) was examined.

Results: OST was significantly higher in the patients group in comparison to the control group, even after adjustment for the effects of various confounding factors ($p_{adj} < 0.001$). OST correlated in both groups significantly with gender, hand-size and Body Mass Index (all; $p < 0.001$). In the patients group, OST correlated significantly with all examined disease activity markers (DAS28, ESR, counts of tender/swollen joints, VAS; all, $p_{adj} < 0.05$) and with age ($p < 0.001$). OST showed significant correlations with a power Doppler ultrasound-Score ($p = 0.001$) and with a combined power Doppler/grey scale ultrasound-Score ($p < 0.001$). Finally, receiver operating characteristic showed the best OST performance at the level of metacarpophalangeal joints level (AUC=0.75; 95%CI=0.686-0.821).

Conclusion: OST correlated with serological and clinical disease activity markers as well as with different anthropometric and epidemiological parameters of RA-patients. OST could therefore prove to be a good non-interventional complementary tool to assess RA activity next to well established diagnostic methods such as the US or MRI.

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Figure 1. Correlations between optical spectral transmission (OST) and A. Disease Activity Score 28-erythrocyte sedimentation rate (DAS28-ESR) ($p < 0.001$), B. DAS28-C-reactive protein (DAS28-CRP) ($p < 0.001$), C. power Doppler ultrasound (PDU) score ($p = 0.001$) and D. combined power Doppler/grey scale ultrasound (PDU/GSUS) score ($p < 0.001$).

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