Background: Multiple studies have demonstrated that shoulder complaints are frequent in Rheumatoid arthritis (RA). Recently, it has been shown that shoulder involvement is predictive for RA development in patients with undifferentiated arthritis (UA) and its value is comparable to that of small joint involvement. The phase of clinically suspectarthralgia (CSA) precedes the phase of clinically apparent arthritis; in this phase subclinical tenosynovitis of the hands, is associated with the development of RA. Given the similarities in predictive values between the shoulder and small joints in UA, and the predictive value of tenosynovitis in CSA, we hypothesized that subclinical tenosynovitis of the bicep tendon is also associated with RA development. We examined the biceps tendon, since this is the only tendon of the shoulder that is enclosed by a synovial sheath as it passes through the bicipital groove.

Objectives: Therefore, the aim of this study is to examine the predictive value of tenosynovitis of the bicep tendon by ultrasound (US) on developing inflammatory arthritis (IA) in CSA-patients.

Methods: The SONAR (Sonographic evaluation of hands, shoulders and feet in patients with rheumatic arthralgia to identify subclinical arthritis) is a multi-center observational cohort study in which patients were followed for the development of clinically apparent inflammatory arthritis (IA); Visits were done at baseline and 6 month thereafter. At baseline a US of both shoulders was made 1-year follow-up data were used. IA was defined as having an arthritis verified by the treating physician. US abnormalities of (1) the biceps tendon, (2) the glenohumeral joint and (3) the subdeltoid bursa, were assessed for tenosynovitis, arthritis and bursitis. Reference values for tendon thickness and effusion of the bursa were determined according to Schmidt et al.[1]

Results: A total of 170 patients were included and underwent bilateral ultrasound (US) of the shoulder joint. Shoulder symptoms were infrequent (Table 1). After one year 37 patients developed IA (22%). ACRA positivity was associated with the development of IA (Table 1). As presented in Table 1, US abnormalities of the shoulder were found but none were associated with IA-development. In particular biceps tenosynovitis was not increased in the patients that developed IA.

Table 1. Baseline characteristics and ultrasound abnormalities at baseline in patients with CSA.

| Baseline characteristics | All CSA-patients (n=170) | CSA-patients with IA (n=37) | CSA-patients without IA (n=133) | P value |
|-------------------------|-------------------------|---------------------------|-------------------------------|--------|
| Gender, female, n (%)   | 140 (82)                | 30 (81)                   | 110 (83)                      | 0.82   |
| Age, years, mean (SD)   | 45 (12)                 | 47 (12)                   | 44 (12)                       | 0.28   |
| Symptom duration, weeks median (IQR) | 30 (19-43) | 37 (23-43) | 28 (19-39) | 0.14   |
| TJC44, median (IQR)     | 5 (3-8)                 | 5 (3-8)                   | 5 (3-8)                       | 0.81   |
| Shoulder pain, n (%)    | 9 (5)                   | 9 (5)                     | 9 (5)                         | 0.10   |
| SJC44, median (IQR)     | 0 (0-0)                 | 0 (0-0)                   | 0 (0-0)                       | -      |
| ESR, median (IQR)       | 10 (5-21)               | 11 (5-22)                 | 11 (5-21)                     | 0.61   |
| RF-positive, n (%)      | 46 (28)                 | 12 (34)                   | 34 (26)                       | 0.33   |
| ACNA-positive, n (%)    | 26 (16)                 | 10 (29)                   | 16 (12)                       | 0.019  |

US abnormalities of the shoulder

Any US abnormalities, n (%) (n=170)

| Biceps tendon Tenosynovitis, n (%) | 19 (12) | 5 (15) | 14 (11) | 0.48 |
| Biceps tendon thickness, n (%)    | 6 (4)   | 0 (0)  | 6 (5)   | 0.19 |
| Subdeltoid bursa effusion, n (%)  | 29 (18) | 3 (9)  | 26 (21) | 0.094 |
| Effusion joint, n (%)             | 0 (0)   | 0 (0)  | 0 (0)   | -    |

Abbreviations: IA: Inflammatory Arthritis, TJC44: Tender Joint Count in 44 joints, SCJ44: Swollen Joint Count in 44 joints, ESR: Erythrocyte sedimentation rate, RF: Rheumatoid Factor, ACPR: Anti-citrullinated Protein Antibody

Conclusion: Subclinical tenosynovitis of the shoulder is not an early feature of RA in patients with CSA.

Reference:
[1] Schmidt WA, Schmidt H, et al. Standard reference values for musculoskeletal ultrasonography. Ann Rheum Dis. 2004 Aug;63(8):988-94.