Background: At time of Rheumatoid arthritis (RA) diagnosis, patients typically present with clinical arthritis of hand and foot-joints. It is unknown whether RA develops in hands or feet.

Objectives: To investigate this, we performed functional, clinical and imaging studies during progression from clinically suspect arthralgia (CSA) to RA. We also studied whether functional disabilities of hands/feet in CSA contribute to predicting RA-development.

Methods: 600 CSA-patients were followed for development of clinical inflammatory arthritis (IA) during a median follow-up of 25 months, of whom 99 developed IA. Functional disabilities were measured at baseline/4/12/24 months with the Health Assessment Questionnaire Disability-Index (HAQ); HAQ-items assessing hand- and foot-disabilities were selected. The course of disabilities towards IA-development (here considered as t=0) was depicted by increasing incidences and analysed using linear mixed models. To evaluate robustness of findings, tender hand/foot joints and subclinical joint-inflammation (measured with CE-1.5TMRI of hand/foot) were additionally studied. Associations between disabilities at CSA-presentation (here t=0) and future IA-development were studied using Cox-regression in the total CSA-population.

Results: During IA-development, hand-disabilities occurred earlier and more frequently than foot-disabilities. Despite both hand- and foot-disabilities rose significantly towards IA-development, hand-disabilities were more severe during this course (mean difference over time: 0.41 units, 95%CI=0.28-0.55,p=0.001, on a range 0-3). Similar to functional disabilities, tender joints and subclinical joint-inflammation occurred earlier in the hands than feet (Figure 1). In the total CSA-population, a single HAQ-question on difficulties with dressing (hand-functioning) was independently predictive for IA-development: HR=2.2, 95%CI=1.4-3.5, p=0.001.

Conclusion: Evaluation of functional disabilities, supported by clinical and imaging findings, revealed that joint involvement starts predominantly in the hands during RA-development. Additionally, a single question on dressing-difficulties adds value to risk stratification in CSA-patients and is easy to use in clinical practice.

Figure 1. Functional disabilities (A), tender joints (B) and subclinical joint-inflammation (C) towards IA-development occur earlier and more frequently in the hands than in the feet.