14. *Ultrasound Doppler activity correlates with systemic autoimmunity and swollen joints in a healthy population at risk for rheumatoid arthritis.*

L. Brulhart, E. Ciubotariu, M. J. Nissen, D. Gascon, S. Bas, C. Gabay, A. Finckh.

Background: Diagnosing rheumatoid arthritis (RA) early and identifying pre-clinical RA has become a high-stakes undertaking. In RA patients, musculoskeletal ultrasound (US) is more sensitive than clinical assessment for synovitis detection. Whether US is associated with joint involvement in healthy individuals at increased risk for RA is unknown.

Objectives : To assess the value of US to detect specific phases leading to the development of RA in a healthy population at risk of RA.

Methods: This study is nested within an ongoing prospective cohort study of healthy first degree relatives of RA patients (FDRs), who had no established rheumatologic condition at inclusion. Data collection includes health questionnaires, physical examination and blood test including inflammatory markers, HLA-DR genotyping and determination of rheumatoid factor (RF) and anti-cyclic citrulinated peptide antibodies (ACPAs) levels. A standardized US examination was performed according to the OMERACT criteria: synovitis was scored in B-mode and Doppler by a semi-quantitative scale ranging from 0 to 3 on MCPs and PIPs 2 to 5, wrists, olecranon fossa and knees. A composite endpoint of either presence of auto-antibodies (RF-IgM, RF-IgA or ACPAs) or at least one swollen joint on examination was chosen
(group 1). To test if US was independently associated with the primary end point, we used logistic regression, adjusting for potential confounders such as age, sex, body index, Caucasian race and smoking.

Results: Hundred consecutive healthy FDRs were included in this analysis. Baseline characteristics were similar between the two groups except for swollen joints and RF by definition. Doppler activity was detected significantly more often in
group 1 (60% versus 34% in the control group, p=0.05, adjusted OR: 3.02 (95%CI: 0.82 – 11.1). The mean Doppler score was also significantly higher in group 1: 1.46 compared to 0.62 (p=0.02, adjusted OR: 1.64 (95%CI: 1.01 – 2.66)). However, neither the presence of synovitis grade 2 or 3 on B-mode (47% versus 42%, p=0.76) nor the median B-mode score (6 (IQR: 4 – 9) versus 6 (IQR: 4 – 10), p=0,75) allowed to discriminate between two groups.

Conclusions: Doppler signal on US was associated with the presence of autoantibodies or clinical signs of synovitis, thus identifying early signs of arthritis in a healthy population at risk of RA.