

Metacarpophalangeal cartilage loss in rheumatoid arthritis. A simple and fast ultrasonographic assessment comparing patients and healthy controls.

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Background: There is evidence supporting the use of ultrasonography (US) as a valid and reliable imaging tool to evaluate cartilage in patients with arthritis. The aims of our study were to measure cartilage thickness in rheumatoid arthritis (RA) patients compared with Healthy Subjects (HS) and evaluate the relationship between US findings and clinical variables.

Methods: We designed a cross-sectional study including patients with diagnosis of RA (ACR/EULAR 2010) and HS. Data collected included clinical and demographic characteristics, Body Mass Index (BMI), 28-joint disease activity score (DAS28) and labor characteristics. US evaluation was performed by two rheumatologist with experience on US who were blind to clinical data. The hyaline cartilage of the metacarpal heads for fingers 2–5 was bilaterally scanned from the dorsal aspect with metacarpophalangeal joints in a full flexed position. Two perpendicular measurements at the central cartilage area (transverse and longitudinal views) were obtained and average cartilage thickness recorded. The association between RA characteristics and cartilage thickness was assessed using univariate and multivariate models, adjusted for sex, age, BMI and labor characteristics. Differences between HS and RA patients were compared using t-test. A two-sided P value of 0.05 was considered statistically significant.

Results: We included 98 subjects: RA=45 and HS=53. Mean age was 49 ± 13 years, mean BMI was 25 ± 4 and 70% were female. Patients with RA were significantly older and had lower BMI than HS. Patients with RA had a mean disease duration of 8 ± 7 years, 60% had erosive disease and mean DAS28 of 4.8 ± 1.4 . A total of 784 joints were evaluated (RA=360 and HS=424). Time to perform US examination was 6 minutes per patient. Correlation between transverse and longitudinal view was 0.97 ($p < 0.01$). Interobserver correlation was very good (ICC > 0.92). Patients with RA had significantly lower cartilage thickness than HS (mean: 0.43 mm versus 0.58 mm, $p < 0.01$). After adjusting for sex, age, BMI and type of job, RA was independently associated with cartilage thinning. In patients with RA, those who were older, had longer disease duration, women and erosive disease, had significantly lower values of cartilage thickness. On multivariate regression analysis, only longer disease duration remained significantly associated with lower values of cartilage thickness ($\beta -0.51$, $p < 0.01$).

Conclusion: Patients with RA showed significantly lower values of cartilage thickness as compared to healthy controls, having disease duration the highest impact on this fact. The impact of cartilage thinning on pain and functional capacity deserves further investigation.