

Ultrasonography Assessment of the Hands As a Measure of Disease Activity in Rheumatoid Arthritis Patients: Correlation with DAS28 Score.

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Background/Purpose: Disease activity score (DAS) 28 is widely accepted for the assessment of disease activity in rheumatoid arthritis (RA). Ultrasound (US) has become an important tool to monitor inflammatory activity in RA patients. The objective was to correlate different US indexes constructed by the inclusion of different number of joints with the level of disease activity measured by DAS 28 in RA patients.

Methods: RA (2010 ACR/EULAR criteria) consecutive patients \geq 18 years old attending the outpatient Rheumatology Unit were included. Exclusion criteria were: hands surgery and/or corticosteroid injection within the last 2 months. All patients were clinically assessed by the attending rheumatologist and the level of disease activity was measured using DAS 28 score. In the same day US examination was performed by the same rheumatologist sonographer blinded to clinical data, using a My Lab 70 (Esaote) machine equipped with 6–18 MHz broad band multifrequency linear transducer. US assessment consisted in bilateral examination of the dorsal aspect of wrist, metacarpophalangeal (MCP) and proximal interphalangeal (PIP) joints. The following abnormal US findings were examined and classified as present or absent: joint cavity widening (JCW), due to synovial fluid and/or synovial hypertrophy, and power Doppler (PD) signal. Three different ultrasound indexes were constructed by the sum of JCW and PD scores of individual joints included in each index: index A including both wrists, all bilateral MCP and PIP joints (22 joints) score; index B: including both wrists, both 2nd and 3rd MCP and both 2nd and 3rd PIP (10 joints); and index C: including both wrists and both 2nd and 3rd MCP (6 joints). Correlation between the indexes and DAS28 was performed with Spearman's rho test. Receiver operating characteristic (ROC) analysis was used to evaluate the discriminative utility of each index, and detect the optimal cut off value.

Results: Sixty RA patients (85% female, mean age 59 \pm 15 years, 75% were anti CCP positive, 55% were FR positive, mean DAS 28 score 3.69 \pm 1.42) were evaluated. All three indexes were significantly higher in patients with active disease (table). Index C had the best correlation with DAS28 (table). Index C showed a very good discriminative value for disease activity defined as a DAS28 score \geq 3.2 and for absence of remission defined by a DAS28 score \geq 2.6 (area under de ROC curve \geq 0.75 (95% CI: 0.62–0.88) and \geq 0.80 (95% CI: 0.67–0.93), respectively). A cut off value of 3 points showed sensitivity of 88.89% and specificity of 66.67% for absence of remission defined by a DAS28 score \geq 2.6.

Table. US indexes and their correlation with DAS28 score.

	Index A: 22 joints (both wrists and all MCP and PIP joints)	Index B: 10 joints (bilateral wrists, 2 nd and 3 rd MCP and 2 nd and 3 rd PIP)	Index C: 6 joints (bilateral wrists, and 2 nd and 3 rd MCP)
Correlation with DAS28 score (Spearman's rho test)	rho= 0.4513 (p=0.0003)	rho= 0.4979 (p=0.0001)	rho= 0.5020 (p<0.0001)
Mean (SD)US score in Active (DAS28>2.6; n=45) vs. inactive disease (DAS28<2.6; n=15)	12.2 (9.8) vs. 5.8 (7.2); p=0.0231	8.3 (5) vs. 3.6 (3.8); p=0.0014	6.4 (3.4) vs. 2.8 (2.6); p=0.0005

Conclusion: US indexes including JCW and PD scores showed moderate to good correlation with DAS28 score. The index with fewer included joints (6 joints) showed the best correlation and discriminative value, perhaps reflecting better clinical assessment of these limited number of joints by the rheumatologist.