

## Value of Color Doppler Ultrasound Assessment of Sacroiliac Joints in Patients with Inflammatory Chronic Low Back Pain.

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**Background/Purpose:** The utility of ultrasound in the evaluation of sacroiliitis has not been extensively studied yet. To evaluate the diagnostic value of color Doppler ultrasound (US) for the detection of sacroiliac (SI) active inflammatory lesions in patients with inflammatory chronic low back pain (LBP).

**Methods:** Consecutive patients older than 18 years, with chronic inflammatory low back pain, defined as LBP with more than 3 months of continuous duration, of insidious onset, with improvement with exercise, no improvement with rest, and pain at night (with improvement upon getting up), without a definitive diagnosis (patients at risk of having undetected spondyloarthritis (SpA)), referred from orthopedics or general practitioners clinics for an axial magnetic resonance imaging (MRI), were included. Patients with Ankylosing spondylitis (AS) according to modified New York criteria, were included as control group. Clinical assessment included BASDAI, BASFI, and HAQ. Ultrasound evaluation was performed by a blinded rheumatologist experienced in this technique with a My lab 70 machine (Esaote) with a multi-frequency convex array transducer (1–8 MHz). Standardized scanning method was used to investigate increased local perfusion with color Doppler US. When color Doppler signal was found in or around the SI joints, spectral Doppler was used and the resistive index (RI) was measured. Color Doppler US sacroiliitis was defined as a positive color Doppler signal with a RI  $\geq 0.75$  at any of the SI joints.

The following sequences were used on the MRI assessment: T1-weighted spinecho (SE) and short-tau inversion recovery (STIR). MRI sacroiliitis was defined according to ASAS definition of active sacroiliac inflammatory lesions.

Sensitivity, specificity, positive and negative predictive values for the diagnosis of sacroiliitis by color Doppler US features was calculated, using MRI as the gold standard.

**Results:** Forty-four patients were included. Twenty-four (54%) were males. Mean age was: 40 years (SD: 11 yrs). Median disease duration was 2 years (IQR: 0.5–10 yrs). Mean BASDAI was 4.8 (SD: 2.4), mean BASFI: 3.6 (SD: 2.7), and mean HAQ was 0.6 (SD: 0.5). Ten patients had AS. Among all patients, 21 (48%) had active sacroiliitis by MRI. Active sacroiliitis by MRI was present in 4 (40%) of AS patients, and in 17 (50%) of patients with inflammatory LBP, respectively.

Color Doppler US sensitivity for the diagnosis of sacroiliitis among all patients was 62% (95% CI: 48–76%) and specificity was 91%. (95% CI: 83–99.6%). Positive predictive value (PPV) was 87% (95% CI: 77–97%) and negative predictive value (NPV) was: 72% (95% CI: 59–86%). Among AS patients observed values were: sensitivity 75% (95% CI: 48–100%), specificity 83% (95% CI: 60–99), PPV: 75% (95% CI: 48–100%) and NPV: 83% (95% CI: 60–99%) and among inflammatory LBP patients diagnostic test values were: sensitivity 59% (95% CI: 42–75%), specificity: 94% (95% CI: 86–100%), PPV: 91% (95% CI: 81–100%) and NPV: 70% (95% CI: 54–89%).

**Conclusion:** color Doppler US seems to be a practical and useful tool for the diagnosis of active sacroiliitis. Larger studies would be needed to confirm these results.