

Association of Contextual Factors with Sonographic Inflammatory and Structural Phenotypes in Psoriatic Arthritis Patients

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Background

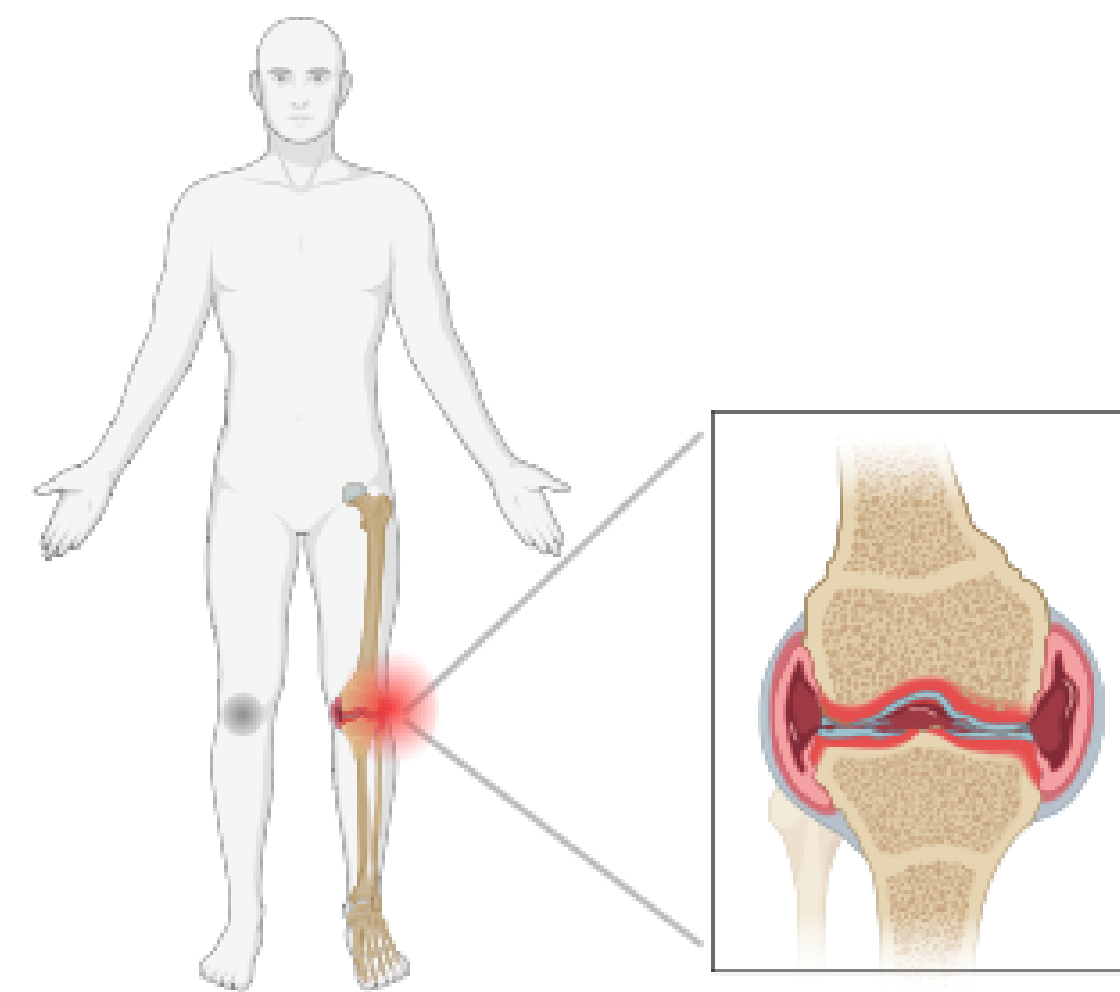
Ultrasound (US) is recognized for enhancing disease activity assessment in Psoriatic Arthritis (PsA). However, the influence of various contextual factors on US abnormalities in PsA remains poorly understood.

Objective

Our study aims to assess how contextual factors impact the presence and severity of several sonographic lesions in patients with active PsA.

Methods

115 patients with active psoriatic arthritis were assessed before starting or changing to another therapy



Clinical and Sonographic Assessment:

- US Protocol: 64 joints, 16 entheses, and 34 tendons;
- Evaluation for inflammatory (inf) and structural (str) lesions, including synovitis, enthesitis, peritendon inflammation (PTI), tenosynovitis (TN), bone erosion (BE), and new bone formation (NBF).
- Each lesion was scored with semi-quantitative score for B-mode and Doppler images

The following contextual factors were evaluated:

- Age (≥ 60 vs. < 60);
- Sex (female vs. male);
- Body mass index (BMI) (≥ 30 vs. < 30);
- Diabetes (yes vs. no)
- Alcohol (none vs. social/daily);
- Smoking (current/past vs never);
- Disease duration (< 1 year vs. ≥ 1 year);
- Biological/target-synthetic disease-modifying anti-rheumatic drug (b/tsDMARDs) exposure.

Statistical Analysis:

- T-test
- Multivariable analysis
 - Outcome: US scores
 - Covariates: Contextual factors

Results

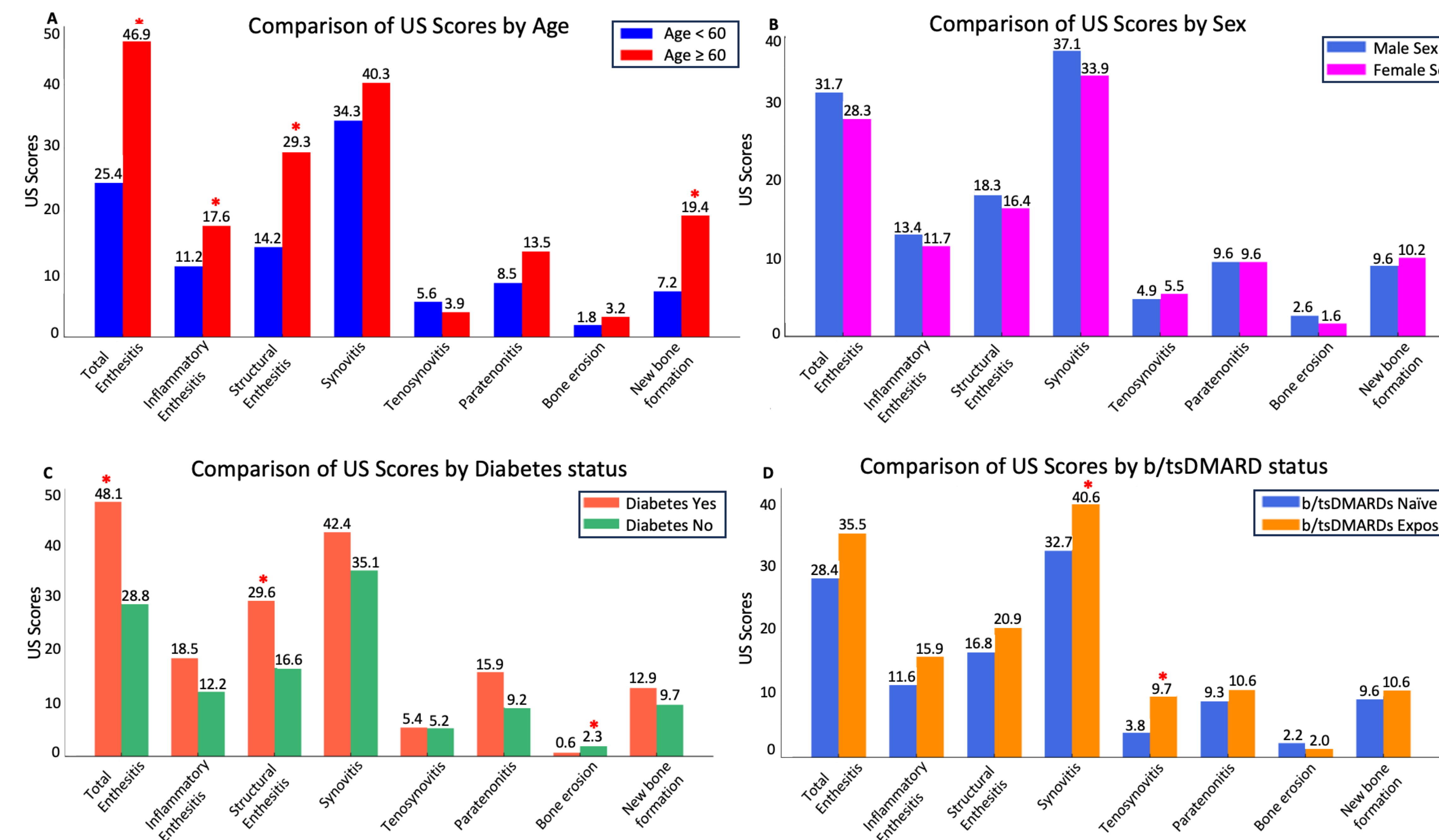


Figure 1. T-test comparison of contextual factors and sonographic features. Sonographic features marked with a “red asterisk” represent significant associations ($p < 0.05$).

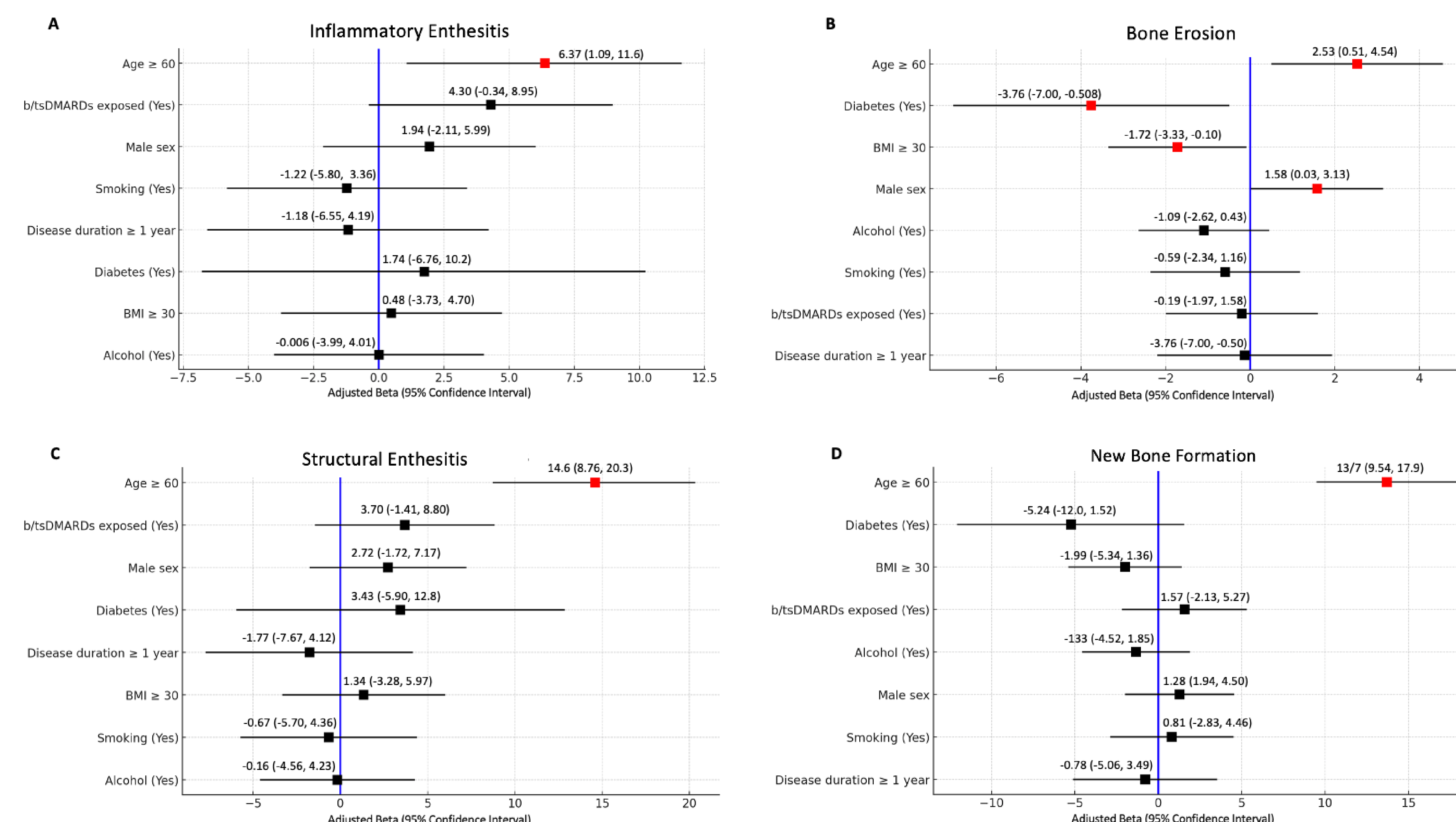


Figure 2. Multivariable analysis illustrating the impact of contextual factors on sonographic abnormalities. Displayed are adjusted beta coefficients with 95% confidence intervals. The “red boxes” indicate significant results ($p < 0.05$).

Results

Table 1. Baseline patient characteristics.

Variables	Total (N = 115)
Age (years), mean (SD)	47.19 (13.89)
Sex (female), n (%)	55 (47.83%)
BMI ≥ 30 , n (%)	43 (37.39%)
Diabetes (yes), n (%)	8 (6.96%)
Smoking status (ever), n (%)	29 (25.22%)
Alcohol (daily/social), n (%)	58 (50.43%)
Disease duration < 1 year, n (%)	16 (13.91%)
b/tsDMARD exposed, n (%)	27 (23.48%)
NSAIDs (yes), n (%)	69 (60%)
Corticoid (yes), n (%)	1 (0.87%)
DAPSA, mean (SD)	22.67 (12.87)
SPARCC index, mean (SD)	1.52 (1.72)
PASI, mean (SD)	4.65 (5.79)

Table 2. Total sonographic scores.

Total Sonographic Scores	Mean (SD)
Total enthesitis (inf+str)	30.13 (22.12)
Inflammatory enthesitis	12.59 (10.80)
Structural enthesitis	17.54 (13.09)
Synovitis	35.63 (22.94)
Tenosynovitis	5.24 (8.27)
Paratenonitis	9.64 (10.20)
Bone erosion	2.17 (4.17)
New bone formation	9.90 (9.71)

T-test comparisons (Figure 1):

- Age ≥ 60 group had significantly higher sonographic inf and str enthesitis, BE, and NBF scores (**Figure 1A**);
- There were no sex differences (**Figure 1B**);
- Patients with diabetes had higher str enthesitis, but lower BE scores (**Figure 1C**);
- Synovitis and TN scores were significantly higher in b/tsDMARDs-exposed (**Figure 1D**);
- No differences in US scores with other factors.

Multivariable analysis (Figure 2):

- Age ≥ 60 was independently associated with higher inf and str enthesitis;
- b/tsDMARDs-exposure was associated with higher synovitis and TN scores;
- Age ≥ 60 , male sex, BMI ≥ 30 , and type II diabetes were significantly associated with BE score, with older age also being associated with NBF.

Conclusions

- Older age was linked to more severe inflammatory and structural ultrasound lesions in PsA, possibly due to an overlap with age-related conditions like osteoarthritis.
- Higher synovitis and TN scores in patients exposed to b/tsDMARDs indicate its potential as a severity marker.
- While diabetes was associated with increased structural enthesitis, and decreased BE and NBF, factors like sex, smoking, alcohol consumption, and disease duration showed no significant impact on ultrasound findings.

- These results highlight the importance of patient demographics and treatment history in personalized PsA management.

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