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Toward Increasing Precision in the Early Diagnosis of Psoriatic Arthritis

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ABSTRACT. The Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) ultrasound (US) group continued its focus on developing an early diagnostic tool for psoriatic arthritis (PsA). During the annual US workshop at the GRAPPA 2024 annual meeting in Seattle, Washington, participants reviewed preliminary analyses from the Diagnostic Ultrasound Enthesitis Tool (DUET) study and discussed the initial results of a DUET substudy aimed at defining enthesitis at the single enthesis level. Participants also previewed the ongoing systematic review of articular and periarticular manifestations of PsA, with particular attention to smaller joints. A summary of the 2024 US workshop is given herein.

Key Indexing Terms: enthesitis, GRAPPA, psoriasis, psoriatic arthritis, sonography, ultrasound

Introduction

The Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) ultrasound (US) group continued to focus on developing a diagnostic tool for the early diagnosis of psoriatic arthritis (PsA). During the US workshop, participants reviewed preliminary analyses from the Diagnostic Ultrasound Enthesitis Tool (DUET) study by exploring the initial results of a DUET substudy aimed at defining enthesitis at the single enthesis level. Participants also previewed the ongoing systematic review of articular and periarticular manifestations of PsA, with particular attention to smaller joints. A summary of this workshop is detailed below.

DUET study update

The DUET study aims to establish a novel sonographic scoring system for enthesitis to enhance the diagnosis of PsA. Dr. Lihi Eder presented the findings from the preliminary analysis of DUET at the GRAPPA 2024 annual meeting. The initial analysis examined the distribution of elementary US lesions in individuals with PsA compared to controls.

The prevalence of inflammatory lesions was generally higher in patients with PsA compared to controls, although the degree of variation depended on the specific entheseal site. Notable differences were observed at the patellar tendon insertions (both patella and tibial tuberosity), Achilles tendon, and triceps tendon. Although power Doppler (PD) signals were infrequent overall, these signals were significantly more pronounced in patients with PsA. Bone erosions were rare across most sites but were predominantly observed in PsA cases. Enthesophytes were common in both patients with PsA and controls. However, patients with PsA exhibited larger enthesophytes at the patellar tendon origins and insertions and the Achilles tendon.

Overall, the preliminary analysis suggests that sonographic entheseal abnormalities are not exclusive to PsA. Therefore, distinguishing PsA from controls requires a scoring system that considers the presence, severity, and anatomical site affected by the specific lesions. These findings will guide the development of a composite US scoring system designed to improve PsA diagnosis.

Definition of enthesitis

Following the presentation by Eder, Dr. Ribeiro introduced a new DUET substudy aimed at defining inflammatory enthesitis at the single enthesis level in PsA. This study addresses the limitations of the Outcome Measures in Rheumatology (OMERACT) definitions, which identified 6 elementary lesions typical of enthesitis.[1] Although these lesions are characteristic of enthesitis, recent studies have shown that these lesions are also prevalent in healthy controls within the general population.[2] This prevalence reduces the lesions' discriminatory power in diagnosing PsA.

To overcome these limitations, the DUET project was initiated to develop an enthesitis scoring system for the early diagnosis of PsA.[3] However, DUET did not define inflammatory enthesitis at the single enthesis level. The current project aims to fill this gap by developing a data-driven, consensus-based definition of inflammatory enthesitis specific to PsA at the single enthesis level.

The project began by establishing a panel of 10 experts who had previously participated in the DUET study. An initial survey gathered these experts' opinions on how they assess enthesitis during US examinations. Next, the panel of experts met to discuss the project and review selected scans showing various severities of entheseal lesions. Finally, a second survey assessed

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whether the discussion had influenced the experts' opinions on inflammatory enthesitis. Following these preliminary steps, a reading exercise was conducted using Research Electronic Data Capture (REDCap). Each investigator scored 90 US scan videos displaying differing severities of enthesitis. The scores ranged from -10 to 10 based on the likelihood of the displayed enthesitis being noninflammatory (closer to -10) or inflammatory (closer to 10); scores close to 0 were uncertain. Additionally, each scorer provided open-text feedback to explain their scores. To confirm a diagnosis of inflammatory arthritis, we required ≥ 70% investigators to score a scan between 7 and 10.

Preliminary results from the quantitative analysis of the reading exercise classified the 90 scans into 3 categories: 29 were definite inflammatory enthesitis, 21 were noninflammatory, and 40 were uncertain. The level of certainty varied by the site being assessed; 77% of plantar fascia scan scores and 66% of quadriceps tendon scan scores were uncertain. These 2 regions had the highest proportion of uncertain scans, likely due to mechanical enthesitis confounding the assessment.

Scans classified as inflammatory enthesitis had more elementary lesions than uncertain and noninflammatory scans. Approximately 93% of the definite inflammatory scans had a combination of ≥ 4 elementary lesions, in contrast to 100% with 0 lesions or 1 lesion in noninflammatory scans (Figure 1). PD signals were present in 96.5% of inflammatory enthesitis scans and 55% of uncertain scans. Though PD signals alone were insufficient to classify definite inflammatory enthesitis, the severity of the PD signal was crucial in determining a definite inflammatory classification. Most inflammatory scans had PD grade II or III, whereas grade III was present in only 7.5% of scans from the uncertain group (Figure 2). Additionally, most scans classified as inflammatory enthesitis had a high-degree PD signal combined with at least 2 other elementary lesions. These findings highlight the importance of combining multiple results to diagnose inflammatory enthesitis confidently.

Future steps for the project include complementing these preliminary analyses with in-depth quantitative analyses. Additionally, a thematic analysis of the comments for each scan will provide deeper insights into the reasoning behind each score. Combining these findings, we aim to develop a preliminary definition of inflammatory enthesitis, which will undergo Delphi voting by the research panel.

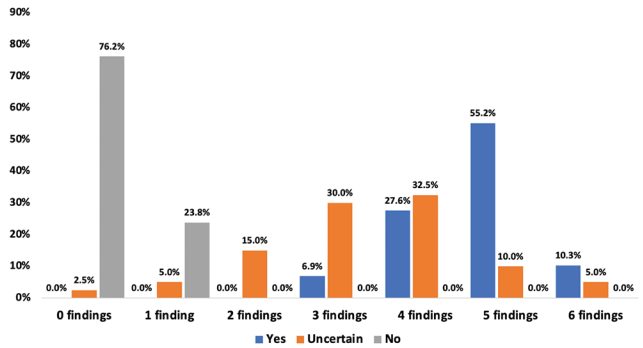

Figure 1. Distribution of elementary lesions across ultrasound scan categories, classified as inflammatory enthesitis (blue), uncertain (orange), or noninflammatory (gray) based on the number of elementary lesions observed. The x-axis represents the number of elementary lesions detected in each scan, ranging from 0 to 6 findings. The y-axis indicates the percentage of scans that fall into each category.

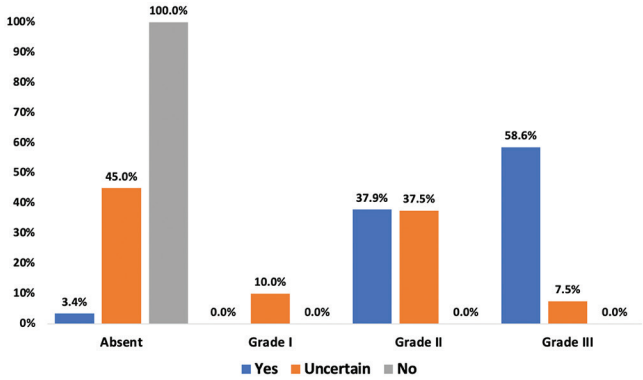

Figure 2. Distribution of PD scores per ultrasound scan category, categorized as inflammatory enthesitis (blue), uncertain (orange), or noninflammatory (gray) according to the PD score. The x-axis represents different PD score categories, which include absent, grade I, grade II, and grade III, whereas the y-axis displays the percentage of scans within each classification. PD: power Doppler.

Systematic review of small joints

A GRAPPA subgroup recently conducted a systematic review to investigate the articular and periarticular distribution of sonographic musculoskeletal inflammation in patients with psoriatic disease. The ultimate goal was to identify a set of candidate joints and tendons that could facilitate the early diagnosis of PsA using US. With the involvement of a large team of young GRAPPA members, 2664 articles were screened, and 163 articles were included in the systematic review. Initial findings presented in the workshop revealed major heterogeneity among studies in terms of design, criteria for defining US abnormalities, and patient profiles. This variability likely contributed to the wide range of prevalence estimates for lesions such as synovitis, enthesitis, paratenonitis, and subcutaneous tissue thickening. The group is currently analyzing the differences across studies and summarizing the prevalence of the lesions accordingly, with results to be published separately.

Conclusion

US remains a promising tool for the early diagnosis of PsA. The preliminary results from the DUET study emphasize the importance of considering contextual factors when interpreting US entheseal scores. A future diagnostic tool must account for these factors, and clearer definitions of inflammatory enthesitis at the enthesis level may further increase its specificity.

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COMPETING INTERESTS

The authors declare no conflict of interest relevant to this article.

ETHICS AND PATIENT CONSENT

Institutional review board approval and patient consent were not required.

PEER REVIEW

As part of the supplement series GRAPPA 2024, this report was reviewed internally and approved by the Guest Editors for integrity, accuracy, and consistency with scientific and ethical standards.

REFERENCES

1. Balint PV, Terslev L, Aegerter P, et al. Reliability of a consensus-based ultrasound definition and scoring for enthesitis in spondyloarthritis and psoriatic arthritis: an OMERACT US initiative. Ann Rheum Dis 2018;77:1730-5.
2. Ribeiro AL, Eder L. From psoriasis to psoriatic arthritis: ultrasound insights connecting psoriasis with subclinical musculoskeletal inflammation and the path to psoriatic arthritis. Curr Rheumatol Rep 2024;26:235-47.
3. Eder L, Kaeley GS, Aydin SZ. Development and validation of a sonographic enthesitis instrument in psoriatic arthritis: the GRAPPA diagnostic ultrasound enthesitis tool (DUET) project. J Rheumatol Suppl 2020;96:50-2.