Psoriatic arthritis (PsA) has historically been considered a milder rheumatic disease not yielding significant clinical damage. However, recent studies have shown that PsA can be deforming and debilitating and that joint damage can be severe. Typically, joint damage has been recorded using plain radiographs. Characteristic radiographic features of PsA include joint erosions, joint space narrowing, bony proliferation including periarticular and shaft periostitis, osteolysis including "pencil in cup" deformity and acro-osteolysis, ankylosis, spur formation, and spondylitis. New imaging modalities, including ultrasound, bone scanning, and magnetic resonance imaging may help in both diagnosis and follow up of patients with PsA. These new imaging techniques will with validation help detect early changes in the peripheral joints, the periarticular tissues, and the spinal structures in patients with PsA.

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ULTRASONOGRAPHY
Musculoskeletal ultrasound has been used for several years to assess joint pathology and may have utility in assessing disease activity in patients with inflammatory joint disease including PsA. The use of high frequency transducers (10 MHz or more) provides excellent tissue resolution. Ultrasound can be used to assess synovial tissue, joint effusions, erosions, and in conjunction with Doppler interrogation, a qualitative measure of hyperaemia, which may be

**Abbreviations:** PsA, psoriatic arthritis; RA, rheumatoid arthritis
an indirect sign of inflammation. Doppler may also be an important tool in assessing tenosynovitis and more specific features of PsA such as enthesitis. Enthesitis at Achilles' tendon is identified by ultrasonography in a much higher frequency than on clinical examination in patients with psoriasis and PsA. However, the sonographic findings are non-specific, as they may occur in patients with osteoarthritis and RA as well as in patients with PsA. It will therefore be important to correlate these qualitative features with histopathology. Ultrasonography may be a useful tool in the assessment of dactylitis.

SCINTIGRAPHY

Bone scintigraphy has been used widely in the past, but is now being supplanted with ultrasound and magnetic resonance imaging (MRI) techniques. It has been somewhat useful in detecting inflammatory changes, especially in situations where the radiograph is normal. However, it lacks specificity. Occasionally sacroiliitis and enthesal inflammation can be identified with scintigraphy.

COMPUTED TOMOGRAPHY

Computed tomography (CT) may be useful in assessing elements of spine disease, but has little role in assessment of peripheral joints. It has been shown to be similarly accurate in assessment of erosions in sacroiliac joints when compared to MRI but is not as effective in distinguishing synovial inflammation. It also may be used to help guide sacroiliac joint injection.

MRI

Structural damage has been a major outcome measure in patients with RA and PsA and has traditionally been measured using scoring methods applied to plain film radiography. An international Outcome Measures in Rheumatology Clinical Trials (OMERACT) MRI in RA working group has been developing a scoring system to assess synovitis, bone oedema, and erosions in hands and wrists that would satisfy the OMERACT filter. Since patients with PsA share many of the same clinical features as patients with RA, this MRI scoring system might also be a potential outcome measure in patients with PsA. MRI may have the advantage of detecting some of these features earlier than plain radiography. This is important in that response to treatment and disease activity may be measured before structural damage occurs. MRI was recently used to measure synovial vascularity in the RA wrist following initiation of therapy, an approach that is currently being employed in a current PsA trial with antitumour necrosis factor (anti-TNF) therapy (P Mease, personal communication).

In a study of infliximab in PsA, MRI was used to detect changes in inflammatory activity as measured by a significant reduction in gadolinium uptake following treatment. However, similar to ultrasound, since some of these measured features are non-specific, it will be important to obtain histopathological correlation whenever feasible and to enrol patients in longitudinal studies to validate this modality as an outcome measure of disease.

We conclude that, in addition to plain radiographs, these new imaging techniques with validation will help detect early changes in the peripheral joints, the periarticular tissues, and the spinal changes in patients with psoriatic arthritis.

Authors’ affiliations

P A Ory, University of Washington, Seattle, WA and Highline Community Hospital, Burien, WA, USA

D D Gladman, Toronto Western Research Institute, Psoriatic Arthritis Program, University Health Network, Centre for Prognosis Studies in the Rheumatic Diseases, Toronto Western Hospital, Toronto, Ontario, Canada

P J Mease, Seattle Rheumatology Associates and Swedish Medical Center Rheumatology Research Division, University of Washington School of Medicine Seattle, WA, USA

Correspondence to: Dr D Gladman, Toronto Western Research Institute, Psoriatic Arthritis Program, University Health Network, Centre for Prognosis Studies in the Rheumatic Diseases, Toronto Western Hospital, 399 Bathurst St. ECW 5-034B, Toronto, Ontario, MST 2SB, Canada; dafna.gladman@utoronto.ca

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