Contrast-enhanced whole body joint MR Imaging in rheumatoid patients on tumour necrosis factor-alpha agents: a pilot study to evaluate novel scoring system for MR synovitis

Sirs,

In the past decade the development of biological agents particularly those which target tumour necrosis factor alpha (anti-TNF-α) has started a new era in the management of rheumatoid arthritis (RA). Data from recent studies in patients with RA show that these drugs are very effective in improving clinical and functional outcomes, and have demonstrated the ability to arrest or even reverse radiographic progression (1, 2). In recent years, magnetic resonance imaging (MRI) has increasingly been used as outcome measures in clinical trials of RA (3, 4). Presence of inflammatory involvement of joints other than the hand especially if clinically occult, potentially alter treatment. The aims of the present study were to introduce and describe a novel scoring system for the assessment of whole body joint synovitis, and to assess the relationship with clinical findings in a longitudinal setting in rheumatoid patients treated with anti-TNF-α agents.

The study, which met the requirements of our institutional review board for a retrospective observational study, included 12 consecutive patients (2 men and 10 women; median age, 60 years; age range, 35–73 years) who started anti-TNF-α treatment. The patients had arthritis with a median symptom duration of 55 months (range: 7–276 months), receiving various dose of methotrexate. All patients satisfied the American College of Rheumatology revised 1987 criteria for RA (5) at the time of entry.

Ten patients received intravenous injections of infliximab (Remicade; Tanabe Pharmaceutical, Tokyo, Japan) and 4 patients received etanercept (Enbrel; Amgen, Pfizer/Wyeth, Takeda). The kinds and amounts of other drugs that each patient was taking were not changed during the study period. Each patient was clinically evaluated and underwent MR imaging at baseline and followup. Contrast enhanced MRI was performed on a 1.5T whole body MR system (Magnetom Avanto; Siemens Medical Solutions, Erlangen, Germany) in a way described elsewhere (6). Briefly, the joints of 13 body regions for each patient: the atlantoaxial joint, bilateral shoulder joints, bilateral wrist joints, bilateral MCP joints, bilateral hip joints, bilateral knee joints, and bilateral metatarsophalangeal (MTP) joints were scanned and evaluated. Image acquisition was started immediately after completing contrast injection and joints were scanned in the order mentioned above. The examination time was less than 30 minutes. The MR images were assessed by one experienced radiologist, who was blinded to all clinical information. Hand joints were evaluated according to RAMRIS for synovitis. Remaining joints were scored in the similar way as the rheumatoid arthritis MRI scoring system (RAMRIS) for hand joints (7).

Table. Correlation in treatment effect between MR measures and clinical data / disease activity.

	ΔMR-positive joint count			ΔMR synovitis score		
	Total	Hand	Remaining	Total	Hand	Remaining
ΔTJC	0.573§	NS	0.554§	0.620§	NS	0.642§
ΔSJC	NS	NS	0.587§	0.598§	NS	0.647§
ΔVAS	NS	NS	NS	NS	NS	NS
ΔESR (mm/hr)	NS	NS	NS	NS	NS	NS
ΔCRP (mg/dl)	NS	NS	NS	NS	NS	NS
ΔDAS28-ESR	NS	NS	NS	0.576§	NS	NS

Δ (delta) means difference between baseline and folow-up studies. §$p<0.05$.

Both MR-positive joint count and MR synovitis score for hands joints did not correlate with any of the measures for clinical data and disease activity. On the other hand, both MR-positive joint count and MR synovitis score for remaining joints correlated moderately to strongly with some measures for clinical data and disease activity. There was moderate positive correlation between delta MR synovitis score for total joints (hands and remaining joints) and delta DAS28-ESR. Here, delta means the difference between baseline and follow-up studies (Table I).

MR imaging findings of the systemic joints correlate with clinical findings in RA patients, especially when scoring analysis for synovitis is performed. Compared to hand joints, changes in MR synovitis score caused by therapeutic agent such as anti-TNF-α may be more sensitive in remaining joints. This may indicate that images obtained beyond the appropriate time window of 5–10 minutes after contrast injection (8) are useful to evaluate the response to treatment. Although the group of patients studied was small and non homogeneus, this approach may be useful for sensitive analysis of systemic synovitis in rheumatoid patients. Study with a greater number of patients with healthy controls is necessary to obtain more solid conclusions.

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