RHEUMATOID ARTHRITIS

Predicting RA progression

Figure 1 | Hand radiographs, **a** | at baseline and **b** | after 10 years.

Calprotectin, a calcium-binding protein released from activated leukocytes, is found in abundance in the synovial fluid of patients with rheumatoid arthritis (RA), and has previously been identified as an inflammatory marker of disease activity. A study published in the *Annals of the Rheumatic Diseases* now suggests that calprotectin could also be a useful prognostic marker for radiographic and clinical joint damage in RA.

The researchers, led by Dr Hilde Berner Hammer (Diakonhjemmet Hospital, Oslo, Norway), assessed hand radiographs of 124 patients (mean disease duration 2.2 years) at baseline and again at 10 years (Figure 1), using the change in van der Heijde modified Sharp score to determine disease progression. The results revealed a highly significant correlation between the progression of joint damage and baseline calprotectin levels, with higher calprotectin levels indicating more-severe disease at 10 years. This relationship remained significant, albeit moderately, after adjustments were made for baseline levels of other serological and inflammatory markers, including antibodies against cyclic citrullinated peptide and C reactive protein, as well as baseline erythrocyte sedimentation rate. The researchers suggested that a baseline calprotectin level of 1.86 mg/l (normal level

0.91 mg/l) is the lowest level that could reliably predict radiographic progression, with a sensitivity and specificity of 69% and 66%, respectively. Baseline calprotectin level was also an independent predictor of clinical joint damage at 10 years, as assessed by the Rheumatoid Arthritis Articular Damage score.

In contrast to acute phase proteins, which are produced by hepatocytes in response to inflammatory cytokines, calprotectin is released directly from activated leukocytes in the inflamed synovium of patients with RA. Hammer's team suggest, therefore, that calprotectin concentrations correlate directly with the degree of inflammatory activity in the joints of affected patients. The ability to predict joint damage by means of such markers that are measurable early in the disease course could help tailor therapy to individual patients, potentially leading to better treatment outcomes. "In the future, calprotectin concentrations might be assessed in RA patients, and efforts made to lower its concentration", suggests Hammer.

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Original article Hammer, B. H. *et al.* Calprotectin (a major S100 leukocyte protein) predicts 10-year progression in patients with rheumatoid arthritis. *Ann. Rheum. Dis.* doi:10.1136/ard.2008.103739 (2008).