Lay title: Developing a disease activity score that better reflects inflammation in the joints.

Article title: Validity of a two-component imaging-derived disease activity score for improved assessment of synovitis in early rheumatoid arthritis
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What was already known?

Joint inflammation is a characteristic feature of rheumatoid arthritis (RA) and many of the drugs used were developed in order to control inflammation. In clinic, disease activity is assessed using the Disease Activity Score in 28 joints (DAS28), which assesses four components a) the number of tender joints, b) the number of swollen joints, c) an inflammatory measure in blood (either CRP or ESR*) and d) a visual analogue score (VAS) of global well-being, assessed by the patient on a one-to-ten sliding scale. We have already shown that the tender joint count and VAS are influenced by psychological factors, such as anxiety and mood, and recent genetic studies have shown that only the swollen joint count and blood markers are genetically influenced. Therefore, if we want to identify genetic or other factors that provide information on whether a drug is likely to be effective in the future (predictive biomarkers), we need a disease activity score that reflects inflammation in the joint.

What did this study do?

We used information from two separate studies to compare each component of the DAS28 to see which correlated best with the amount of joint inflammation assessed using ultrasound scanning. It was found that in both studies it was b) the swollen joint count and c) the CRP blood test that best reflected the amount of inflammation. A 2 component disease activity score was generated (2C-DAS28) and tested in a third, independent study where ultrasound information was available. This confirmed that the 2C-DAS28 showed better agreement with joint inflammation than the original DAS28. We next tested which was better at predicting long-term joint damage using another independent study where X-ray information was available. This showed that the 2C-DAS28 was much better at predicting the development of erosions (joint damage) than the original DAS28.

What does the study mean?

We have developed a measure that better reflects joint inflammation, the target of current treatments for RA. That means that we will be better able to identify ways of predicting which drugs will be effective for different patients in the future and will help us to match the right treatments to the right patients. Patients with lots of tender joints or high VAS score in the absence of joint inflammation may need different approaches to treatment.

*CRP and ESR are proteins measured in blood that increase in response to inflammation, infection and some other conditions.