Rituximab versus tocilizumab and B-cell status in TNF-alpha inadequate-responder rheumatoid arthritis patients: the R4-RA RCT

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Plain English summary

The R4-RA RCT

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Plain English summary

Rheumatoid arthritis is a common disease in which the immune system attacks the joints, causing pain, stiffness and swelling.

In 40% of patients, conventional chemical drugs do not work and expensive 'biological' therapies are prescribed; however, these therapies can have serious side effects. The first biological drug to be prescribed is usually a type called a tumour necrosis factor inhibitor drug. If that fails, a second biological drug, rituximab (MabThera, F. Hoffman La-Roche Ltd, Basel, Switzerland), is recommended.

Rituximab reduces inflammation by attacking a specific type of immune cell (B cells). However, in about half of patients it has been found that, when the joint lining is examined under a microscope, B cells are present in only small numbers or are completely absent.

We reasoned that these patients, said to be B-cell poor, would respond better to another drug, tociluzimab, which works by a different mechanism. If this is the case, it might be possible, by examining a small piece of tissue from the lining of the joint, to predict which patients will respond better to each drug.

We examined the joint lining from 164 rheumatoid arthritis patients from hospitals in the UK, Belgium, Italy, Portugal and Spain who had not responded to tumour necrosis factor inhibitors. Of these patients, 79 were found to have few or no B cells and are described as B-cell poor. Approximately equal numbers of patients were treated with rituximab or tocilizumab (RoActemra, F. Hoffman La-Roche Ltd, Basel, Switzerland). After 16 weeks of treatment, we evaluated the number of tender and/or swollen joints.

We found that disease improvement in B-cell-poor patients was slightly better with tocilizumab than with rituximab, but that the difference was not enough to be sure that it did not arise by chance. However, when we assessed the joint lining tissue using newer, molecular methods and when we measured different outcomes, we found some promising results.

This means that we cannot yet be sure which drugs should be offered to which patients, but the results of this study could lead to further research to improve how we test and treat patients to get the best improvement in their arthritis.

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