Scottish Government Health Directorates Chief Scientist Office

CHIEF SCIENTIST OFFICE

FOCUS ON RESEARCH

TAILORING THERAPY TO INDIVIDUAL PATIENT NEEDS – THE CHALLENGE FACING RHEUMATOLOGISTS WHO TREAT PATIENTS WITH EARLY RA

Researcher: Dr James Dale
Supervisors: Dr Duncan Porter and Professor Iain Mcinnes

Aims

To try and improve the treatment of the early stages of rheumatoid arthritis (RA) by:
1. Determining whether using ultrasound in addition to clinical examination allows rheumatologists to make better treatment decisions and improve disease control
2. Attempting to identify patterns in gene expression blood tests that highlight which patients are likely to experience persistently active, difficult to treat RA

Project Outline/Methodology

Rationale – rheumatologists often find it hard to decide whether or not RA patients need further changes to their treatment because: 1. clinical examination may not detect low levels of joint inflammation and 2. some patients experience joint pain and tenderness that is not related to their RA. In both cases, using ultrasound to confirm the presence / absence of joint inflammation might allow rheumatologists to make better informed treatment decisions Furthermore, it is possible that certain genetic patterns in blood will highlight which patients have ongoing inflammation or are likely to require aggressive treatment from the start

Methods – 111 patients with new diagnoses of RA took part in an 18 month randomised clinical trial. Both groups followed the same treatment steps; however half the patients' RA activity was assessed by traditional clinical examination and half were assessed by clinical examination and musculoskeletal ultrasound. At the end of the study, independent clinical examination and functional ability findings were compared to determine whether ultrasound guided treatment produced better overall treatment responses. Blood samples taken from all patients underwent a detailed genetic (transcriptomic) analysis to identify whether specific genetic patterns were seen in patients with persistently active or aggressive RA.

Key Results

1. Ultrasound identified a higher rate of active joint disease than clinical examination. However, many patients also underwent repeated ultrasound examinations that did not change their treatment
2. Ultrasound lead to patients in the ultrasound group receiving more intensive treatment over the course of the study
3. There was very little difference in clinical or functional ability outcomes between patients in either group
4. Blood gene expression patterns were not associated with disease activity or response to treatment

Conclusions

1. Ultrasound guided treatment does not produce significant improvements in short-term clinical or functional outcomes in early RA, despite leading to more intensive treatment
2. Blood gene expression patterns may not be a useful measure of RA disease activity or likely short-term prognosis

What does this study add to the field?

This study demonstrates that MSUS guided treatment escalation does not lead to improved 18 month clinical outcomes and that currently it is not possible to associate whole blood gene expression signatures with common clinical or disease activity characteristics

Implications for Practice or Policy

These results suggest that there is no additional value in using ultrasound examination to routinely monitor RA disease

Where to next?

To determine the medium term impact of of ultrasound guided treatment on xray and MRI outcomes, adverse event rates and 5 year clinical outcomes

Further details from:

Dr James Dale,
Institute of Infection, Immunity & Inflammation
University of Glasgow
James.dale@ggc.scot.nhs.uk