Title **Use of Modeling to Evaluate new Drugs for Patients With a Chronic Condition: The Case of Antibodies Against Tumor Necrosis Factor in Rheumatoid Arthritis**

Agency **NCCHTA, National Coordinating Centre for Health Technology Assessment**
Mailpoint 728, Boldrewood, University of Southampton, Southampton SO16 7PX, United Kingdom;
Tel: +44 2380 595586, Fax: +44 2380 595639

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Aim

To address the structural issues relating to effects on mortality and quality of life (QoL) and to identify data on the general QoL pattern in rheumatoid arthritis (RA) patients through a restructured, enhanced version of the Birmingham Preliminary Model (BPM).

Conclusions and results

A survey of rheumatologists shows that RA has different manifestations and responds to different agents in different patients. Hence, summarization of practice is difficult and open to criticism for oversimplification. However, the findings generally agree with other surveys and trends, eg, increasing acceptance of methotrexate as the first line drug of choice in RA patients, especially in aggressive disease. The newer agents, antibodies against tumor necrosis factor (anti-TNF) are starting to be used. The focus of the Birmingham Rheumatoid Arthritis Model (BRAM) on a drug sequence helped to avoid the incremental cost effectiveness of new treatments appearing lower than they really are when inappropriate comparators are used. BRAM was run for the strategies representing current UK practice to test the effect on the results of using the disease-modifying antirheumatic sequence. The results differed little from the base-case results.

Recommendations

This work achieved more realistic modeling of real-life clinical pathways and events, as it has developed from the BPM to the BRAM. The approach reflected in the BRAM is applicable to other chronic conditions, especially those involving a sequential approach to therapeutic options. The model was successfully restructured to consider different treatment sequence, including the sequence that best represents current practice in the UK.

Methods

This report uses the BRAM to evaluate two new anti-TFN drugs, etanercept and infliximab, used in treating RA. A rapid systematic review was conducted of physician surveys on the use of DMARDs (disease-modifying antirheumatic drugs) in adult RA patients. A postal survey of consultant rheumatologists in the UK then identified the drug sequences for the model. Using the model, a series of analyses were run. The issue of specifying the correct comparison was investigated using two separate analyses: comparing anti-TNFs with placebo, and comparing a sequence using anti-TNFs with a sequence representing current practice in the UK.

Further research/reviews required

The impact of DMARDs on QoL. The impact of DMARDs on patient life expectancy. Variation in compliance rates across DMARDs. Costs associated with RA incurred by patients and their families, including fuller coverage of adverse events of DMARDs. The costs and benefits of other DMARD sequences (which could be explored using the BRAM).

Written by Dr Pelham Mervyn Barton, Health Services Management Centre, University of Birmingham, UK