Big-data analysis shows not all MS treatments are equal

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A large international study led by Dr Tomas Kalincik of The University of Melbourne together with the global MSBase Consortium has shown that the treatments alemtuzumab (Lemtrada) and natalizumab (Tysabri) can provide better control of relapses than fingolimod (Gilenya) and interferon-beta. The study was published in the prestigious journal *Lancet Neurology*.

There are a range of medications now available to treat relapsing remitting MS. In separate clinical trials, all have been shown to suppress relapses and reduce the risk of disability. However, when it comes to deciding as to which treatment to use for every individual, there is limited evidence directly comparing most of these medications. This means that neurologists and patients must make decisions based on the outcomes of separate clinical trials rather than on direct 'head-to-head' comparisons.

While alemtuzumab was directly compared to interferon-beta in one of the original clinical trials for this medication and shown to be more effective at suppressing relapses. There has never been a clinical trial directly comparing alemtuzumab, natatlizumab and fingolimod, which makes it harder to choose between these medications.

In this study, the researchers used a powerful database analysis technique to effectively compare these medications 'head-to-head'. This study analysed the clinical outcomes of 4332 people with relapsing remitting MS treated with either alemtuzumab, natalizumab, fingolimod or interferon-beta. Data from the MSBase clinical database (which gathers clinical data on over 44,000 people with MS from all over the world), and from patients treated at six other clinical centres in the UK and Germany were combined for this study.

For the purposes of the comparison, the people in the study were matched using a statistical technique called 'propensity matching'. This technique ensures that individuals in each group in the study were matched in age, gender, time since diagnosis, disability level and other factors relating to their disease activity as closely as possible. This method makes it possible to use 'real-world' data from individuals treated in normal medical practice, but aims to mimic the randomised selection of patients that would occur in a clinical trial. The aim is to ensure that any treatment outcomes are most likely to be a result of the different treatments rather than any other differences between the groups.

The study showed that alemtuzumab and natalizumab were approximately equal at suppressing the relapses of MS, and both were better than fingolimod and interferon-beta at suppressing relapses. On the other hand, people receiving natalizumab were more likely to show disability improvement compared to those receiving alemtuzumab, fingolimod or interferon beta, which all showed a similar ability to improve disability outcomes.

The authors conclude however, that alemtuzumab and natalizumab are both equally effective choices for clinicians and people with MS who need to decide whether to switch from a first- or second-line treatment, such as fingolimod or interferon-beta that might not be working for them as an individual. The decision then needs to come down to the relative risks of each medication for the individual concerned.

The authors acknowledge that the study is limited by the absence of systematic and comparable collection of safety data between the Registries used in the study and also by the lack of MRI data in the study. MRI data is frequently used as a method to monitor treatment outcomes for individuals. However, the data provides useful evidence which was previously lacking on the relative benefits of the different medications, and can help guide treatment decisions in the right circumstances.

Everyone's experience of MS and their individual circumstances are different. This means that different medications that work very well for some may not work well for others. Equally, the relative risks and side-effects of medications are also highly individual and dependent on your circumstances. If you have questions about your current MS medication, please discuss you concerns with your neurologist.