Differences in MS attacks with various Disease Modifying Therapies

The number of attacks that MS patients have is one of the most important measures of the disease. It provides a measurement of inflammation that results in damage to the nervous system. Since the FDA requires that a clinical measurement like attack rate or disability be used as the primary outcome for studies, attacks are often used as the main outcome measure in studies. It can be measured a number of ways, including counting the number of attacks, the rate of attacks per year, the time to next attack or the time free of attacks.

It is tempting to compare the attack rates between various studies of MS medications. However, such comparisons are not scientifically valid. The patients enrolled in different studies have differences that cannot be corrected for. One example is the difference in disease severity, with more recent studies enrolling patients that are earlier in the disease course and with fewer attacks per year. Patients come from different regions that have differences is the timing of diagnosis, different treatments and different genetic backgrounds. Many differences are due to factors that cannot even be identified. Because of the impossibility of identifying and correcting for the differences in these populations, scientists strongly discourage comparisons across different studies.

Nevertheless, comparisons have been made and are frequently discussed among those deciding on the use of DMTs. These comparisons are often driven by marketing of particular medications with data selected to favor that particular product. Such comparisons are strongly discouraged. Examples of the decrease in attack rate in large phase III studies include:

- Avonex: 32%
- Betaseron: 34%
- Copaxone: 29%
- Gilenya: 54%
- Mitoxantrone: 65%
- Rebif: 33%
- Tysabri: 68%

Note that Extavia was approved using data from the Betaseron study. Note also that the Avonex study was not designed to evaluate attack rate, but rather the time to worsening of disability. As a result, not all of the patients completed two years on study. Because patients were on the study for different lengths of time, different attack rates have been calculated for Avonex, ranging from 18% to 32%. It is probably most accurate to just admit that the study was not designed to measure attack rates.

Since we believe that these rates cannot be scientifically compared between different studies, we strongly advise that patients make decisions on which DMT to use based on other factors. We believe that only head-to-head studies of medications can accurately predict which one is stronger. Information about head-to-head studies is available on our website.