SHOULD WE MAKE TREATMENT DECISIONS BASED ONLY ON MRI IN MS?

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MRI is the closest thing to a surrogate marker of disease that we have in MS, but falls short of many virtues and hence is not recognized as such by authorities (e.g. FDA). Correlation of change in MRI with clinical disease activity is poor. MRI has its greatest predictive value at the start of disease (CIS), losing ground continuously as the disease evolves. This has led many groups to recommend that MRI not be used to make treatment decisions; rather how the patient does clinically should dictate whether stay the course or change medicines. This may be due to some intrinsic characteristics of the MRI signal. T2 white matter lesions can represent fresh demyelination, remyelination or scarring. Most imaging studies have focused on cranial MRI, whereas most disease progression emanates from spinal cord disease, which is more difficult to quantitate. Although studies have shown large group effects for MRI change, this is difficult to interpret at a single patient level. For instance, as lesions appear, eventually they come together in confluent lesions and this would complicate those that count lesions, since the number would actually decrease. There is also a considerable mismatch between what is seen on MRI vs. clinically. Some studies have shown that before any clinical changes are perceived large number of T2 lesions must occur. Some patients can have 30 or more lesions appear over time with no perceived change in disability scores, whereas others have had large changes (worsening) of disability scores without even a single new lesion appearing. Current medications all aimed at the inflammatory component of MS have been shown to reduce Gd-enhancing lesions (CEL), but not eliminate them completely. If a patient is started on therapy but continues to show at least one CEL, does this constitute a failure? Is it realistic to strive for complete elimination of CEL, if none of the current therapies is capable of achieving this? How often would you need to scan to be sure that CEL is controlled? Studies have shown that to capture all lesions scan rates need to be every 4-6 weeks, but this would be completely impractical. If one uses MRI to assess response to therapy, then what level of change is considered to indicate a poor response if no single agent is capable of completely eliminating the appearance of either new CEL or T2 lesions? Treatment decisions should be first and foremost based on a clinical response. If there is an impression that clinically patients are having a sub-optimal response AND the MRI is showing new activity, then the MRI result can assist in corroborating the clinical impression and a treatment decision made. Admittedly, some clinical change such as cognitive decline is difficult to pick-up at the bedside, so a periodic MRI looking for big changes that would be unexpected in the context of someone who is clinically perceived to be doing well, would be a cause for perhaps further evaluation of cognition.