ALGORITHM FOR INDIVIDUALIZED MS TREATMENT: THE ERA OF PERSONALIZED/TAILORED MEDICINE IN THE FIELD OF MS IS NOT FAR AWAY!

D. Karussis; A. Vaknin-Dembinsky
Department of Neurology, MS Center and Laboratory of Neuroimmunology, Hadassah Hebrew University Hospital, Jerusalem, Israel
karus@cc.huji.ac.il

It is increasingly recognized that the clinical course and the immuno-pathogenesis of MS significantly vary, in distinct subgroups of patients. The various immunomodulatory treatments can preferentially affect (and in different ways and degrees of intensity), distinct immune populations and immune pathways. It will be therefore very helpful to built treatment algorithms and individualize and tailor the most appropriate treatment to each patient, especially now that several new players (new immune therapies) are entering our arsenal of MS treatment options.

It has been argued that there are at least 4 distinct histopathopathological types of MS lesions and it is possible that this typing of the lesions identifies each patient, being unique throughout the disease course. Immunologically, in some of the MS patients, mainly those with the neuromyelitis variants/spectrum of NMO, the pathogenetic mechanisms involve mainly B-cells and antibodies and not the classical T cells of Th1 and Th17 type. Treating such cases with interferons may actually deteriorate the disease. It is therefore of great practical importance to identify the unique clinical and immune identity of each MS case, in order to improve treatment outcome.

Various immunological tests can aid to the immuno-typing of MS in each patient. The presence of oligoclonal antibodies in the CSF not only helps in making the diagnosis more definite, but may also provide some prognostic indications in patients with early MS or a single isolated clinical episode of demyelination. There are also additional and novel biomarkers including novel autoantibodies, chemokines, cytokines and other cell surface markers, which can help in the immunotyping of the pathogenesis of MS in distinct patients. Two of them, for instance, BAFF (a B cell activating factor) and GFAP, when present in the CSF may indicate either an intrathecal activation of B cells or activation of astroglia (mostly associated with a variant of MS, neuromyelitis optica-NMO). Another immune marker, antibodies to AQP4 are also strongly associated with NMO, which is differentiated from MS by both clinical and radiological criteria. In our Center, we have shown that anti-AQP4 abs can be detected not only in NMO patients but also in ADEM, in some of the neuromyelitic types of MS, isolated ON and myelitis and even in some classical cases of MS. There is therefore, an overlap between these conditions and syndromes, and tests for AQP4 and BAFF may help to identify those borderline cases and treat accordingly.

The building of algorithms for treatment of MS should utilize the recently accumulated knowledge on the clinical course of MS and its variants, the neuroradiological and the immunological parameters. Having all these new tools handily, it is feasible to formulate such algorithms which will also identify early the non-responders/failures to a specific treatment, and help in tailoring or changing the treatment accordingly, in each individual patient. Genetic tests may also contribute to the individualization of therapy and the identification of those patients with a good chance to respond well to a specific drug, or possible non-responders to it. It seems that the era of real, personalized Medicine in the field of MS, is not far away.