Pharmacogenetics in multiple sclerosis: the long and winding road ahead of us

Farmacognética na esclerose múltipla: a longa e tortuosa estrada à nossa frente

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The ideal drug has the highest efficacy, the lowest rate of adverse events and a very low cost. Unfortunately, most diseases are not treated with the "ideal drug" and multiple sclerosis (MS) is an important example of this situation. Therapy for MS has unique characteristics, as we do not increase the dose of disease-modifying drugs (DMDs), change drug schedules, or combine different drugs for better results. When a DMD does not provide the optimal response, it is exchanged for another one, and this can happen as many times as the physician in charge deems necessary. Beyond the obvious frustration for the patient, the cost of such a trial-and-error approach is high. If we could use the genetic makeup of a patient to choose the perfect medication for that individual, we could aim for the ideal drug for that particular patient with MS. Pharmacogenetics is the study of how genetic differences can affect variation in responses to therapy, thus allowing us to achieve "personalized medicine" through optimal decisions[1]. Using pharmacogenetics, we could treat each patient with MS with the ideal drug for maximal benefit.

In the present issue of *Arquivos de Neuro-Psiquiatria*, Werneck et al.[2] discuss the personal data of 87 patients with MS, genotyped for HLA-DRB1, HLA-DPB1, HLA-DQB1, HLA-A, HLA-B and HLA-C alleles. They analyzed the neurological disability outcomes of these patients in relation to their genetic background and the use of specific DMDs. Unfortunately, these researchers found only a few relationships between the patients' HLA profile and their response to drugs. Their conclusion was that there might be a relationship between the HLA profile and the effect of DMDs on some HLA class I and II alleles in some patients. They advised caution in interpreting their results since there was a limited number of patients with some types of HLA and DMDs.

There are few studies on the pharmacogenetics of MS[3,4,5,6,7,8,9]. The specific response of an individual patient to any of the DMDs remains largely unpredictable, and a trial-and-error approach is the rule when deciding on treatment regimens. It is imperative that we continue research to enable us to predict the optimal benefit-to-risk profile of an individual patient with MS[10]. With more data on the matter, the decision-making process would be greatly facilitated, and the patient would receive a personalized optimal treatment early on in the disease process[11]. There is, however, a long and winding road ahead of us regarding expectations, associations, predictions and recommendations in pharmacogenetics for patients with MS.

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