LETTER TO THE EDITOR

Use of brain atrophy indices in the prediction of disability in patients with multiple sclerosis

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Mr. Editor:
Multiple sclerosis (MS) is a disease characterized by outbreaks of disability in any functional system (visual, motor, sensory, coordination, language and sphincter control, among others) caused by inflammation and demyelination of the central nervous system (CNS). MS is considered to be a multifactorial condition, with genetic and environmental pillars. It is the most disabling non-traumatic disease in the young adult population around the world.[1]

Brain atrophy is a physiological fact of normal aging, but in neurodegenerative diseases the loss of brain parenchyma occurs in an early and more accelerated manner. In MS, brain atrophy is already observed in the early stages, but it is more relevant in its more advanced phases. The annual rate of progression of brain atrophy is approximately 0.5 to 1% in MS patients, higher than in young adults, where it ranges from 0.1 to 0.43% per year. On average, brain volume decreases by 0.8 to 2% per year in the different MS phenotypes, approximately four times more than in the normal population, mainly at the expense of the white matter, whereas in the healthy population it occurs mainly in the gray matter; however, in the progressive stages of the disease, selective atrophy of the deep gray matter is the major contributing factor to the progression of brain atrophy.[2]

MS is the second leading cause of disability in young adults in developed countries and is more common in females than in males.[3]

The most commonly used means of measuring disability and progression of MS are the Kurtzke scale and its expanded version, called the Expanded disability status scale (EDSS). This scale uses a range where zero is normal neurological examination and 10 is death due to MS. One of the most commonly used MS-specific scales is the Multiple Sclerosis Quality of Life Inventory, which consists of the General Health Status Scale (SF-36) and contains 138 items, organized into 10 generic and specific subscales. This instrument was developed from an extensive battery of questionnaires used in the Medical Outcomes Study, which introduces other specific questionnaires of great relevance for the particular analysis of the disease such as the impact of fatigue, the effect of pain, sexual

satisfaction, bladder control, bowel control, the impact of visual impairment, perceived cognitive deficit, mental health and social support.[1,4,5,6,7]

Although there are different two-dimensional linear measures described in the literature for the purpose of assessing MS, most of these are more concerned with the indirect assessment of brain atrophy through the evaluation of ventricular dilatation and are not indicative of atrophy of a particular brain structure. The corpus callosum index, the Evans index and the bifrontal index are the main indices to demonstrate the degree of brain atrophy of a patient. By calculating them in patients with multiple sclerosis, it will be possible to predict those who will evolve more rapidly to disability, according to the degree of severity of demyelinating lesions, and to establish an association between disability and the degree of brain atrophy, which predicts the patients who are more prone to suffer these complications, contributes to their early diagnosis, avoids the disability produced at early ages of life and contributes to changes in the daily lives of these patients.[8]

When studying the patient with MS it is important to determine the onset and evolution of their symptoms, as well as details of previous neurological symptoms that could indicate an undetected early episode and contribute to determine the diagnosis and course of the disease, as well as the appearance of disabilities in early stages. Neurologic examination is important to detect involved areas of the central nervous system and to provide evidence of other lesions.[9]

The number of demyelinating lesions in the CNS has a negative influence on neurological function; the correlation between this and the development of permanent disability is usually only moderate, and only evident in the early stages of the disease, which is elusive or practically negligible in the more advanced forms.[10]

The association that exists between disability and degree of cerebral atrophy, the importance of its early diagnosis and the disability that it produces in early ages of life contribute to changes in the daily life of these patients and cause a cognitive deterioration that affects their quality of life.

Due to the few studies carried out in Cuba and in the Province of Villa Clara on the relation of MS with disabilities in early ages of life, it is proposed, Mr. Director, the intention of the authors to make known to the scientific community that a study is being carried out in relation to this topic in the "Arnaldo Milián Castro" University Clinical Surgical Provincial Hospital, in which it is intended to determine a new knowledge that responds to the partial or total solution of the proposed problem, that is to say, by means of the study it will be intended to publish on the findings of the nuclear magnetic resonance found in the patients attended in the MS Consultation of the Hospital and, in this way, to train the Neurology and Imaging Specialists in the research topic in order to train them in the use of the indexes and to improve the quality of life of the patients under study.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.