CASE

Fourteen-year serial MRIs of patients with mild and severe courses of MS

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Videos

Serial MRIs from 2 patients with relapsing-remitting MS displaying mild (video 1, baseline age: 42 years; disease duration: 1.2 years) and severe (video 2, baseline age: 43 years; disease duration: 1.6 years) brain atrophy with plots of brain parenchymal fraction (BPF),[1] a measure of normalized brain volume, and Expanded Disability Status Scale (EDSS) are presented. Patients were scanned every 6–12 months over 14 years using standardized protocols on 3 scanners (Siemens Vision, Symphony, and Trio).[2] BPF was calibrated across scanners using scan-rescan measurements. During the first year, the severe patient had 10 contrast-enhancing lesions, whereas the mild patient had none. BPF decreased by 2% (mild) compared with 10% (severe) over 14 years.

The mild patient had 1 relapse and continued to ambulate independently. The patient was on IM interferon beta-1a from 1999 through 2011, azathioprine for a month in 2011 (Crohn disease), and methotrexate from 2011 through 2015 (Crohn disease). The severe case had 6 relapses between years 1 and 9; many new T2 lesions during years 1–7 including more than 40 contrast-enhancing lesions; moderate EDSS score until year 12, when motor function deteriorated. The patient was subsequently classified as secondary progressive. The severe patient was treated with interferon beta-1a, rituximab, and natalizumab. Thus, in the severe case, the clinical measures were relatively stable for many years while early MRI indications such as contrast-enhancing lesions, new T2 lesions, and brain volume loss predicted the eventual severe disease course.

These 2 cases demonstrate examples of mild and severe courses of MS, illustrating the relevance of MRI markers of tissue inflammation and destruction

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Disclosure

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Richard A. Rudick, MD	Cleveland Clinic, Cleveland, OH	Writing the grant; designing and conceptualizing the study; played a major role in the acquisition of data; analyzed the data; interpreted the data; and revised the manuscript for intellectual content
Daniel Ontaneda, MD	Cleveland Clinic, Cleveland, OH	Revised the manuscript for intellectual content
Robert J. Fox, MD	Cleveland Clinic, Cleveland, OH	Revised the manuscript for intellectual content
Bruce D. Trapp, PhD	Cleveland Clinic, Cleveland, OH	Conceptualized the submission and revised the manuscript for intellectual content
Elizabeth Fisher, PhD	Cleveland Clinic, Cleveland, OH	Designed and conceptualized the study; played a major role in the acquisition of data; analyzed the data; interpreted the data; and revised the manuscript for intellectual content

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