

Optic Nerve Topography in Multiple Sclerosis Diagnosis

The Utility of Visual Evoked Potentials

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Study Question

Which is the impact of adding the optic nerve region, as evaluated based on visual-evoked potentials (VEPs), as a fifth criterion for dissemination in space (DIS) to the 2017 McDonald diagnostic criteria for multiple sclerosis (MS)?

What Is Known and What This Paper Adds

The 2017 revised McDonald DIS and dissemination in time (DIT) criteria allow a diagnosis of MS in patients presenting with a clinically isolated syndrome (CIS). This investigation's results indicate that the addition of the optic nerve as a fifth region to the dissemination in space (DIS) criteria slightly improves the accuracy and sensitivity of the criteria without losing specificity.

Methods

In this retrospective study, the investigators analyzed data from 388 patients with CIS (68.0% female; mean baseline age, 31.6 ± 8.2 years) who joined the Barcelona CIS cohort between 1995 and 2017. Recruitment occurred within 3 months of symptom onset, and patients underwent baseline brain and spinal cord MRI scans before and after gadolinium administration, and VEP recordings. The cohort members also underwent longitudinal monitoring for a second attack. The investigators developed modified DIS (modDIS) criteria by adding the optic nerve to the current DIS criteria, and used Cox proportional-hazards regression analyses to evaluate the risk of developing a second attack when using the standard 2017 DIS criteria and the modDIS. The diagnostic performance of the current and modDIS criteria was analyzed in a subgroup of 151 patients who had a follow-up for ≥10 years or until presenting a second attack (whichever came first).

Table Criteria-specific Diagnostic Utility Metrics

Diagnostic utility metric	2017 DIS	modDIS	2017 DIS + DIT and/or OB	modDIS + DIT and/or OB
Accuracy % (95% CI)	75.5 (67.8–82.1)	78.1 (70.7–84.5)	72.9 (62.0–79.8)	73.2 (65.5–80.0)
Sensitivity % (95% CI)	79.2 (71.2–85.8)	82.3 (74.6–88.4)	73.9 (65.4–81.2)	74.2 (65.9–81.5)
Specificity % (95% CI)	52.4 (29.8–74.3)	52.4 (29.8–74.3)	66.7 (43.0–85.4)	66.7 (43.0–85.4)

Results and Study Limitations

Within the full cohort, 130 patients (33.5%) experienced a second attack, and all of these attacks occurred within 10 years. Compared with the standard DIS criteria, the modDIS criteria achieved greater accuracy through higher sensitivity without any loss of specificity. Similar results were observed when DIS and modDIS were considered along with the presence of OB and/or DIT, although the improvement was less noticeable. The present study's limitations include limited data concerning intervals between CIS onset and VEP recordings, and slight differences between the present study's cohort and the full Barcelona CIS cohort suggesting a minor selection bias.

Study Funding and Competing Interests

This study received no funding. Some authors report receiving lecture honoraria, consulting fees, travel expenses, and committee appointments from healthcare companies; receiving funding from healthcare companies and the Spanish government; and working on industry-sponsored clinical trials. Go to Neurology.org/N for full disclosures.

A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The corresponding author(s) of the full-length article and the journal editors edited and approved the final version.

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