Oligoclonal Band Number as a Marker for Prognosis in Multiple Sclerosis

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The natural course of disease in multiple sclerosis varies. Multiple sclerosis that is clinically apparent but causes minimal disability over time has been labeled benign multiple sclerosis. The ability to predict the subsequent clinical course of multiple sclerosis on the basis of clinical and other supportive data at presentation would be invaluable. In this article we report our findings based on a retrospective analysis of 1800 patients diagnosed as having multiple sclerosis, of which 44 patients met our inclusion criteria. There was a suggestion that a low or absent number of oligoclonal bands in the cerebrospinal fluid at the time of diagnosis predicts a better prognosis. However, quantification of oligoclonal bands in cerebrospinal fluid remains an insensitive prognostic indicator and must not be used to influence decisions regarding therapeutic options.

The diagnosis of multiple sclerosis (MS) is based on neurologic history, findings on examination, and exclusion of other disorders. The natural course of MS varies. It would be ideal if clinical or laboratory criteria could distinguish patients who will progress to become disabled from those who will not. Patients with benign MS comprise about 10% to 15% of patients with MS and are functional in all neurologic systems 15 years after disease onset. Patients with MS are typically followed up over time on the basis of expanded disability status scale (EDSS) scores. Thus, cognitive and/or upper extremity dysfunction may be underestimated. In addition, the term benign is relative. It has been suggested that a progression index rather than an EDSS cutoff may be more indicative of benign disease.

The single most consistent laboratory abnormality in patients with MS exclusive of magnetic resonance imaging is increased oligoclonal immunoglobulins in cerebrospinal fluid (CSF). In patients with a single demyelinating episode, detection of intrathecal immunoglobulin synthesis may predict progression to MS, and oligoclonal bands (OCBs) in CSF during the early phase of disease are associated with a worse outcome. We report a retrospective analysis of 1800 patients with a diagnosis of MS as judged by clinical, magnetic resonance imaging, and CSF findings at the time of presentation.

RESULTS

Seven of 14 patients in the benign group had no OCBs, and the remainder had 2 to 10 OCBs, with a median of 5. Seven of 30 patients with severe MS had no OCBs. The other 23 patients in this group had 2 to 17 OCBs, with a median of 7. Overall, the mean (SD) number of bands in the benign group was 2.86 ± 3.59, fewer than in the severe group (5.70 ± 4.86; P < .06) (Figure). There was a suggestion that the absence of OCBs correlated with the course of the disease (P = .10, Fisher exact test).

COMMENT

It is intriguing why some patients remain OCB negative despite meeting typical cri-
teria for diagnosis of MS. One explanation could be that demyelination in MS may occur independent of antibody, or CSF electrophoresis methods may be insensitive to detect local synthesis of antibody in all clinically definite cases of MS. Although our study suggests that a low number or absence of OCBs in CSF at diagnosis predicts a better prognosis, no differences in the clinical course and EDSS scores were noted in OCB-negative patients in a study from Japan. Immunoglobulins may contribute to the pathogenesis of MS, and oligoclonal IgM bands may predict progression to MS better than magnetic resonance imaging or IgG testing does. Nevertheless, quantification of CSF OCBs remains an insensitive prognostic indicator and should not be used to influence decisions regarding therapy.

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REFERENCES


PATIENTS AND METHODS

From the 1800 patients, we selected those who (1) had had CSF studies done at this institution at presentation, (2) had preserved polyacrylamide gels at the time of review, and (3) had a minimum follow-up of 10 years. Excluded were those who had died by the time of analysis, had indistinct OCBs, or had OCBs in both serum and CSF.

We divided patients who met inclusion criteria into benign, mild, moderate, and severe categories on the basis of their level of disability, as assessed by their EDSS scores. Of the 1800 patients, 44 who met the inclusion criteria had “benign” (EDSS <3.5; n=14) or “severe” (EDSS >7.5; n=30) disease. All 44 patients included in our study had had more than 1 clinical attack. Mean follow-up for benign and severe groups was 15.8 and 16.2 years, respectively.

The OCB assays were performed at the time of diagnosis by means of gel electrophoresis and isoelectric focusing with silver staining, and were standardized for all patients. One of us (J.L.T.) determined OCB number in the 44 patients in blinded fashion.