SHORT REPORTS

Visual and spinal evoked potentials in diagnosis of multiple sclerosis

The measurement of cortical evoked potentials generated by pattern reversal is a sensitive technique for detecting demyelinating lesions in the anterior visual pathways.[1 2] Similarly changes in the somatosensory evoked potential recorded over the cervical spine[3] have been found in many patients with multiple sclerosis (MS).[4] We have assessed the relative and complementary values of these two techniques in 68 patients with suspected or established MS.

Patients, methods, and results

The patients were classified as definite (23), probable (9), or possible (36) cases of MS according to McAlpine's criteria.[1] Visual evoked potentials (VEPs) were recorded from an active electrode at Oz, with a reference electrode at Pz (10-20 system). Bilateral monocular pattern stimulation was carried out using the technique of Halliday *et al*[1] with modifications.[5] The spinal evoked potential (SEP) was recorded from an active electrode at C2, with the reference electrode at Fz, while stimulating each median nerve separately at the wrist with 100 μs, two-to-three-times-threshold electrical pulses. On-line analysis was carried out with a PDP 11/40 computer. Normal values were established in 20 controls. VEPs were regarded as abnormal if the latency of the major surface-positive component exceeded 118 ms (normal mean + 2·5 SD) or if the latency difference between the responses from the two eyes exceeded 6 ms; SEPs were regarded as abnormal if the latency of the major surface-negative peak exceeded 15·8 ms (normal mean + 2·5 SD) or if the amplitude was less than 1·1 μV. Patients with symptoms or signs of median neuropathy or spondylotic radiculopathy were excluded.

Incidence of abnormal findings in patients with definite, probable, or possible MS. Results expressed as proportions of patients

Classification of MS	No of patients	VEP	SEP	VEP or SEP or both
Definite	23	19/23 (83%)	16/17 (94%)	16/17 (94%)
Probable	9	3/9 (33%)	4/8 (50%)	4/8 (50%)
Possible	36	12/36 (33%)	10/27 (37%)	16/27 (59%)

The table summarises the results. In the definite MS group 19 of the 23 patients (83%) had an abnormal VEP (2 unilateral, 17 bilateral) and 16 out of 17 (94%) an abnormal SEP (10 unilateral, 6 bilateral); three patients with normal VEPs had abnormal SEPs. In the probable MS group three of the nine patients had an abnormal VEP (1 unilateral, 2 bilateral) and four out of eight (two with normal VEPs) an abnormal SEP (three unilateral, one bilateral). Of the 36 possible cases 12 patients had an abnormal VEP (7 unilateral, 5 bilateral) and 10 out of 27 (37%) an abnormal SEP (7 unilateral, 3 bilateral). Of the 27 possible cases in which both VEPs and SEPs were measured 16 patients (59%) gave an abnormal result with one or other or both techniques; six patients with normal VEPs had abnormal SEPs, and four with normal SEPs had abnormal VEPs. Of the patients with abnormal VEPs, 5 (22%) of the definite, 2 (22%) of the probable, and 8 (22%) of the possible cases had no clinical evidence of optic neuropathy. Of the patients with abnormal SEPs, 3 (13%) of the definite, 1 (11%) of the probable, and 8 (22%) of the possible cases had no sensory symptoms or signs.

Comment

These findings confirm the value of measuring VEP and SEP to detect functional abnormalities in the visual and somatosensory pathways in patients with demyelinating disease. The incidence of abnormal VEPs was comparable with that found in studies in the United Kingdom,[1 2] while that of abnormal SEPs was higher.[4] The relative value of the two techniques has not previously been assessed in the same group of patients. With the use of strict criteria for abnormality the incidence of abnormal SEPs was found to be higher than that of abnormal VEPs in each group studied. The increased yield of abnormal results in the possible MS group when both techniques were applied suggests that they have a complementary role in investigating suspected MS. The ability to detect subclinical abnormalities with these techniques emphasises their diagnostic potential in MS.

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[2] Asselman, P, Chadwick, D W, and Marsden, C D, *Brain*, 1975, **98**, 261.
[3] Matthews, W B, Beauchamp, M, and Small, D G, *Nature*, 1974, **252**, 230.
[4] Small, D G, and Matthews, W B, Paper presented at the Association of British Neurologists Meeting, London, December 1974.
[5] Mastaglia, F L, Black, J L, and Collins, D W K, in *Proceedings of 24th Annual Scientific Meeting of Australian Association of Neurologists*, Auckland, New Zealand, February 1976. In press.

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Diarrhoea and perianal vaccinia

Accidental vaccinia has been widely reported. In a year-long nationwide survey in the United States 195 cases were recorded.[1] It occurs mainly in children under 5 years, and in most cases the face and eyes are the regions affected, although the scrotum, vulva, and perianal region may also be affected.[2] Berkowitz[3] described a case of perianal vaccinia in a 5½-year-old boy seven days after vaccination, but in that case the diagnosis was made on clinical grounds only.

Case report

A 19-year-old woman student attended a student health service clinic for a smallpox vaccination before going abroad. She had been vaccinated in infancy and shortly afterwards had been admitted to hospital with gastroenteritis. The vaccination was said not to have been successful and there was no obvious scar of primary vaccination on her upper arms.

She was vaccinated on the left upper arm by the multiple-pressure method (20 pressures). Local reaction was evident on the seventh day, and next day she began to have moderately severe diarrhoea (four to six motions daily), which lasted four days. On the thirteenth day she noticed perianal soreness and irritation, and it was this that brought her for consultation four days later.

There was a cluster of about 12 ulcerated and pustular lesions distributed in a radius of about 3 cm around the anus. The pustular lesions bore a close resemblance to the pustules of vaccinia. A typical encrusted vaccinial lesion was also noted on the left upper arm. Scrapings from the base of the perianal vesicles collected on a glass slide were washed off and suspended in a buffer solution containing penicillin and neomycin. Rhesus monkey kidney tissue culture cells, human amnion, HEp_2, and HeLa cells were inoculated and all showed a cytopathic effect within 48 hours' incubation at 36°C. Chorioallantoic inoculation of 11-day-old fertile eggs incubated for three days at 37°C produced lesions typical of vaccinia.

No treatment was given other than explanation, reassurance, and analgesics by mouth. Four days later no fresh lesions had appeared, and those already present were beginning to encrust. By the twenty-fifth day the lesions had disappeared, although some itching persisted.

Comment

Vaccinia may be accompanied by constitutional upset, fever, lymphadenopathy, and rashes. Diarrhoea is not mentioned in current