
Outcome prediction in comatose patients: significance of reflex eye movement analysis

Sir: The report by Mueller-Jensen et al.1 correctly emphasises the importance of reflex eye movements in predicting outcome from coma. Reflex eye movements were not included in the original descriptions of the Glasgow Coma Scale2 but have been emphasised for diagnostic purposes since 19663 and for prognostic purposes since 1977.4–6 There are two additional points to be made.

Although initially absent oculovestibular responses are a poor prognostic sign, we agree that by themselves, they do not invariably predict a poor outcome. In our comprehensive study of 500 patients in non-traumatic coma,5 122 lacked oculovestibular responses when first examined, and 3% of them ultimately improved so that they were able to live independently. We also agree that initial absence of both pupillary and oculovestibular responses (or of pupillary and corneal responses or of oculovestibular and corneal responses) is incompatible with the resumption of an independent life.

Although preserved tonic conjugate responses to oculovestibular stimulation is a good prognostic sign early in the course of coma, it is a bad sign if it persists. We noted a similar observation in discussing vegetative patients,7 namely that preserved, spontaneous, roving, conjugate eye movements at 7 days were associated with a 72% chance of the patient remaining comatose or vegetative. Similarly, we noted 83 patients who by 7 days still had tonic conjugate responses to oculovestibular stimulation, and 64% of them never improved beyond the vegetative state. The prolonged (1 week) absence of cortical influences on spontaneous or reflex eye movements is an ominous sign.

References

Do white matter changes on MRI and CT differentiate vascular dementia from Alzheimer’s disease?

Sir: Erkinjuntti et al.1 report white matter lesions on MRI in 100% of patients with multi-infarct dementia (MID) and about 35% of patients with Alzheimer’s type dementia (ATD) (figures extrapolated from their data).

A number of observations arise from this paper. They correctly state that Besson et al.2 report proton density values in MID to be lower than in ATD. Proton density values in ATD are higher than those of controls, and controls are the same as MID. Erkinjuntti et al.1 did not measure proton density. They are, however, incorrect in their statement that T1 values were lower in both types of dementia compared with controls. Besson et al.1 demonstrated that white matter T1 was highly significantly increased in ATD and MID compared with controls. Erkinjuntti et al.1 did not examine normal subjects. There was a tendency for white matter T1 in MID to be higher than in ATD but this did not reach statistical significance. These findings are thus compatible with those of Erkinjuntti et al.1 The differences in instrumentation employed in the two studies must also be borne in mind.

Our first study was carried out on an 0-04T (1.7 MHz) resistive system. We have since examined another group of patients with MID, ATD and normal elderly control subjects using a 0-08T (3-4 MHz) system with intercalated saturation recovery/inversion recovery pulse sequence with TR 1000 ms and a tau 200 ms. This study shows that in addition to infarcts, two types of white matter lesion are observed. These are periventricular white matter change (PVWMC) of very high T1 value (> 390 ms) and lower intensity lesions further removed from the surface of the lateral ventricles than the PVWMC and of lower T1 intensity (310–390 ms) than PVWMC. PVWMC is present in both types of dementia but the lower intensity lesions are present in ATD and correlate positively with age. These results are therefore compatible with those of Erkinjuntti et al.1 One of our patients imaged at the age of 63 years, died 3 years later. The image (fig 1) showing areas of increased T1 in white matter adjacent to the anterior and posterior horns of the lateral ventricles (fig 1).
Matters arising

There are two possible explanations for raised $T_1$. Firstly they may be related to ischaemic consequences of vascular fibrous sclerosis. These were, however, not identified histologically, and it seems unlikely that the vascular fibrous sclerosis in itself could account for this extent of white matter change. Secondly, reduction in neural elements, as occurs in regions of rarefaction, could result in increased water content and raised $T_1$. This is a more likely explanation.

Fig 2 White matter, left frontal region, showing pallor of myelin staining in central white matter beside corpus callosum (Luxol fast blue)

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Table Mean $T_1$ (ms) white matter in Alzheimer’s disease (ATD) and control subjects

<table>
<thead>
<tr>
<th>Controls (n = 10)</th>
<th>ATD (n = 22)</th>
<th>Reported case</th>
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<tbody>
<tr>
<td>L. frontal</td>
<td>277</td>
<td>324</td>
</tr>
<tr>
<td>R. frontal</td>
<td>282</td>
<td>316</td>
</tr>
<tr>
<td>L. middle</td>
<td>285</td>
<td>292</td>
</tr>
<tr>
<td>R. middle</td>
<td>289</td>
<td>292</td>
</tr>
<tr>
<td>L. posterior</td>
<td>290</td>
<td>370</td>
</tr>
<tr>
<td>R. posterior</td>
<td>292</td>
<td>359</td>
</tr>
</tbody>
</table>

sures in six regions of interest (left and right frontal, left and right middle and left and right posterior) are shown (table) and compared with normal elderly controls and patients with Alzheimer’s disease. The $T_1$ white matter was raised in the case and in the ATD group in both frontal and posterior regions, but mostly in the latter.

Necropsy confirmed the cortical atrophy and ventricular dilation present on images, and Alzheimer’s disease as the only diagnosis. There were numerous senile plaques and neurofibrillary tangles especially in the cortex of the parietal and occipital regions. Arterio-sclerotic changes in the large vessels were minimal and there was mild generalised fibrous sclerosis of the arterioles. Rarefaction in myelin stained preparations was present bilaterally in the central frontal white matter (fig 2), slightly more prominent on the left than the right. This was not associated with infiltration by granular, clonal or recognisable glosis and there were no occluded blood vessels. Staining for amyloid was negative.

References


Book reviews


All neurologists and many scientists working in the field of neuroscience will enjoy and learn from these two readable volumes. The first contains a review on Huntington’s disease and myasthenia and the second on dementia and demyelinating disease (chiefly multiple sclerosis). The authorship of each chapter consists of one clinically based and one or two laboratory based investigators leading to wide coverage of the available knowledge on these diseases in keeping with the aim of the series which is stated to be for integrated chapters that will both educate clinicians and basic scientists. Thus in the review on Huntington’s disease (Bird and Coyle) the pathology, biochemistry and endocrinology of the condition are all discussed. The case for excitotoxins being involved in the mechanism of cell death is made and the potential for that hypothesis lead to a form of treatment discussed. The G8 probe is discussed in some depth in a way that most will find easy to understand. Perhaps there could have been a little more discussion about genetic counselling which is dealt with rather briefly and is a subject full of difficult and evolving issues. If I have any reservations about this article it is on the clinical side, but there are plenty of easily obtained alternative sources and the chapter otherwise brings together a comprehensive review that most will find helpful. The chapter on myasthenia gravis (Harrison and Behan) is rather longer and heavily referenced. Historical aspects, clinical features, diagnostic tests, pathology, genetics, treatment and the animal model are all discussed in depth, as befits the best understood of the autoimmune diseases. One or two statements might raise an eyebrow or two, such as “complete third nerve palsy virtually never occurs” or that the majority of patients have increased reflexes and I suspect not everyone will agree entirely with the plan of management, in particular the programme for giving steroids. They do not exactly emphasise how much the advent of steroid treatment has changed the outlook for the vast majority of patients with significant myasthenia to the extent that most clinicians no longer use the adjective gravis. On discussing aetiology viruses are invoked but little made of the only known cause of myasthenia which is induced by a