The 'eye test' in the identification of patients with late-onset Alzheimer's disease

SIR—A rapid, non-invasive and specific diagnostic test for Alzheimer's disease (AD) is not currently available. In 1994, Scinto and colleagues [1] proposed that the pupillary response to a very dilute solution of tropicamide, a cholinergic antagonist, might be such a test. However, the observation of a greater mydriatic response in patients with AD than in normal elderly controls was not confirmed by Loupe and colleagues [2] or by Litvan and FitzGibbon [3], whose work challenges the validity of the test.

To verify the original hypothesis, we enrolled 36 aged outpatients (mean age 73.4 years, SD 6.0): 15 with probable or possible AD according to NINCDS-ADRDA criteria, five with vascular dementia (VD) according to NINDS-AIREN criteria and 16 elderly subjects without cognitive deficit. A fourth group comprised 12 young healthy subjects (mean age 27.3 years, SD 3.1).

All subjects underwent a complete ophthalmological evaluation before entering the study. Exclusion criteria included eye diseases, history of eye surgery, use of medications that could influence pupillary motility and diabetes mellitus.

Baseline measurement of pupil diameter in both eyes, with the patient seated in a semi-darkened room, were obtained with a computerized video-pupillography system (C2514 IRISCORDER, Hamamatsu, Japan), supplied with an infrared light source. Pupil diameter of both eyes was then measured 30 and 40 min after the administration of a drop of 0.01% tropicamide in the inferior fornix of one eye (randomly chosen) and of a drop of distilled water in the other eye.

The analysis of variance for repeated measures was utilized, using the change of pupil diameter from baseline in the eye treated with tropicamide as a dependent variable. In a second analysis, we considered the change in anisocoria (difference between the change of pupil diameter in the treated eye and that in the contralateral eye) as a dependent variable, using the factorial analysis of variance and multiple comparisons method according to Bonferroni.

The mean baseline value of pupil diameter (estimated in the treated eye) was greater in the young control group (mean 5.81 mm, SD 0.61) than in any of the older groups [mean values: 4.30 mm (SD 0.57) for AD, 3.94 mm (SD 0.99) for VD and 4.38 mm (SD 0.56) for elderly controls (P<0.001)]. This finding confirms the well-known tendency of the pupil to become smaller with age.

The mean changes in pupil diameter of the treated eye from baseline at 30 and 40 min after drop administration are presented in Table 1. Although the mean dilation was greater in the AD group than in the VD group and in the elderly control group and least in the young control group, these differences were not statistically significant (P=0.124).

The change in anisocoria at 30 min differed significantly between the young control group (mean 0.21 mm, SD 0.46) and the AD group (mean 0.90 mm, SD 0.83; P<0.05), but not among the AD group, the elderly control group (mean 0.67 mm, SD 0.55) and the VD group (mean 0.82, SD 0.21). Moreover, this significance was lost at 40 min after drop administration (P=0.07).

In conclusion, our results, in line with those of other investigators, do not confirm Scinto's report of pupillary hypersensitivity to anticholinergic agents in patients with AD; we therefore do not agree that the 'eye test' is of use for identifying individuals with AD.

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<table>
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<th>Time (min)</th>
<th>EC (n = 16)</th>
<th>YC (n = 12)</th>
<th>AD (n = 15)</th>
<th>VD (n = 5)</th>
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<tbody>
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<td>0.52 (0.48)</td>
<td>0.12 (0.38)</td>
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<tr>
<td>40</td>
<td>0.57 (0.59)</td>
<td>0.13 (0.45)</td>
<td>0.82 (0.59)</td>
<td>0.74 (0.38)</td>
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EC, elderly control; YC, young control; AD, Alzheimer's disease; VD, vascular dementia.
Emotions, aerophagia and severe abdominal distension in an elderly person

SIR—Excessive air-swallowing and severe abdominal distension may occur in association with several medical conditions [1] but is mostly seen in mentally retarded patients. It is unusual as a manifestation of self-injurious behaviour in older people.

A widowed 71-year-old patient was admitted to the geriatric ward with a suspected vertebrobasilar stroke. He had mild Parkinson's disease controlled by amantadine, moderate cognitive impairment and mild depression treated with doxepin and sulpiride. He complained of dizziness and unsteadiness. Neurological evaluation was normal except for extrapyramidal signs, as was a brain computed tomography scan.

Doxepin and sulpiride were stopped as they may have been aggravating his symptoms. His condition improved, but he was unwilling to be discharged. Shortly after being asked to go home, he became restless and started stereotyped air-swallowing which resulted in severe abdominal distention (Figure 1). He was treated by fluids and a duodenal tube. This was removed 3 days later, but was re-inserted three times because of recurrent abdominal distention. During this period, the patient had spontaneous bowel movements.

Psychiatric evaluation revealed no depressive features, but an avoidant and antisocial personality disorder. Blood tests and a complete gastrointestinal tract investigation were normal. Passage of barium showed no delay, but very large amounts of air were observed. The doxepin and sulpiride were resumed and the patient reassured about his future placement. This resulted in rapid improvement of mood, cessation of swallowing movements and a resolution of abdominal distension.

We presume that this case of aerophagia was triggered by a functional psychiatric decompensation and stress associated with hospitalization, that ultimately resulted in this self-injurious abnormal behaviour pattern. This may also be supported by the fact that, despite re-administration of doxepin (with its known anticholinergic effects), there were no further

Figure 1. Severe gaseous distention involving stomach (left) and large bowel (right).