Clinical features of transient monocular blindness and the likelihood of atherosclerotic lesions of the internal carotid artery

R C J M Donders for the Dutch TMB Study Group (see appendix)

Abstract
To assess which features of transient monocular blindness (TMB) are associated with atherosclerotic lesions of the ipsilateral internal carotid artery (ICA), 337 patients with sudden, transient monocular loss of vision were prospectively studied. History characteristics of the attack were compared with the presence of atherosclerotic lesions of the ipsilateral ICA. All patients were directly interviewed by a single investigator. Of all patients, 159 had a normal ICA on the relevant side, 33 had a stenosis between 0%-69%, 100 had a stenosis of 70%-99%, and 45 had an ICA occlusion.

An altitudinal onset or disappearance of symptoms was associated with atherosclerotic lesions of the ipsilateral ICA. A severe (70%-99%) stenosis was also associated with a duration between 1 and 10 minutes, and with a speed of onset in seconds. An ICA occlusion was associated with attacks being provoked by bright light, an altitudinal onset, and the occurrence of more than 10 attacks. Patients who could not remember details about the mode of onset, disappearance, or duration of the attack were likely to have a normal ICA. Our findings may facilitate the clinical decision whether or not to perform ancillary investigations in these patients. (J Neurol Neurosurg Psychiatry 2001;71:247–249)

Keywords: transient monocular blindness; stenosis; occlusion

Transient monocular blindness (TMB) is usually attributed to transient ischaemia of the retina in one eye, or part of it. These episodes are considered transient ischaemic attacks (TIAs) in the territory of the internal carotid artery (ICA). Other causes of transient loss of vision include migraine, optic neuropathy, and intrinsic eye diseases.

Patients with TMB associated with atheromatous disease have a risk of ipsilateral stroke of about 3% a year. This risk is two to three times lower than in patients with cerebral TIAs. Despite the lower risk, they should receive anti-thrombotic treatment and are candidates for carotid endarterectomy in cases of a stenosis of the ipsilateral ICA of more than 70%.

Although early identification of patients with TMB is important, it is often difficult to distinguish these patients from those with a more benign cause. The range of symptoms of TMB is wide and patients often find it difficult to describe what happened to their eyesight some time ago. Yet the management can only be based on the history.

To assess which symptoms of TMB are associated with large vessel atherosclerosis, we prospectively related different characteristics of the history with the presence or absence of atherosclerotic lesions in the ipsilateral ICA.

Methods
We included 337 consecutive patients who recently experienced a sudden, transient loss of vision in one eye that lasted no longer than 24 hours and was not caused by overt ophthalmologic disease. Patients were initially seen by neurologists or ophthalmologists in 18 participating centres (see appendix). After written consent, all patients were questioned by direct interview about the details of their transient loss of vision by one of us (RCJMD). This detailed history was based on a standardised questionnaire. Patients were interviewed after a median period of 6 weeks after their last attack. We classified characteristics of the history according to the following characteristics: the extent of the visual field involved, visual symptoms experienced, mode and speed of onset and of disappearance of symptoms, duration and number of attacks, the performance of a cover test during attacks, and provocation by bright light only (retinal claudication). If the patient did not spontaneously mention the nature of a predefined characteristic, the possibilities in that category were read out by the investigator. The patient could answer “yes”, “no”, or “I don’t know”. If the patient had no memory of certain details of the attack, those characteristics were classified as unknown. If an uncategorised symptom was mentioned by the patient, this was recorded in the patient’s own words and classified afterwards in one of the predefined categories by two of us (RCJMD, LJK), who were at that time blinded to the results of ancillary investigations. Disagreement was resolved by means of
Table 1 Characteristics of the history of 337 patients with transient loss of vision of one eye with sudden onset that are significantly associated with the presence or absence of any atherosclerotic lesion of the ipsilateral ICA. Other characteristics were not associated with the absence or presence of any atherosclerotic lesion of the ipsilateral ICA.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Presence (n=337)</th>
<th>Yes (n=178)</th>
<th>No (n=159)</th>
<th>OR*</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alitudinal onset</td>
<td>57 (17)</td>
<td>25</td>
<td>8</td>
<td>4.1</td>
<td>2.0–8.7</td>
</tr>
<tr>
<td>Alitudinal disappearance</td>
<td>54 (16)</td>
<td>22</td>
<td>10</td>
<td>2.7</td>
<td>1.4–5.4</td>
</tr>
<tr>
<td>Unknown mode of onset</td>
<td>41 (12)</td>
<td>7</td>
<td>18</td>
<td>0.4</td>
<td>0.2–0.8</td>
</tr>
<tr>
<td>Unknown mode of disappearance</td>
<td>65 (19)</td>
<td>15</td>
<td>24</td>
<td>0.6</td>
<td>0.3–1.0</td>
</tr>
<tr>
<td>Unknown duration</td>
<td>8 (2)</td>
<td>1</td>
<td>4</td>
<td>0.1</td>
<td>0–1.0</td>
</tr>
</tbody>
</table>

ICA=internal carotid artery.

*Odds ratio (OR) for presence versus absence of any atherosclerotic lesion in the ipsilateral ICA.

Discussion

To the best of our knowledge, this is the largest prospective series of patients with TMB studied to date. The “classic” pattern of brief attacks with sudden onset and an alitudinal onset or disappearance of symptoms was associated with severe atherosclerotic lesions in the ICA. Patients unable to remember details about the onset, duration, or disappearance of symptoms are likely to have a normal ipsilateral ICA.
Earlier studies addressed the association between TMB and the presence of atherosclerotic lesions of the (ipsilateral) carotid arteries, but only few studies related the fine details of TMB to atherosclerotic lesions of the ipsilateral ICA. Prediction of the presence of a high grade ICA stenosis from the type of TMB was unsuccessful in one study. Another study showed that TMB with a gradual onset was associated with normal carotid arteries. In only a single study gradual onset was associated with normal ipsilateral ICA. These results may help to identify patients with sudden, transient loss of vision in one eye who have a high or a low likelihood of severe atherosclerosis of the ipsilateral ICA.

In conclusion, patients with attacks of TMB provoked by bright light are associated with an ipsilateral ICA occlusion. Patients with TMB who could not remember details of the attack more commonly have a normal ipsilateral ICA. These results may help to identify patients with sudden, transient loss of vision in one eye who have a high or a low likelihood of severe atherosclerosis of the ipsilateral ICA.

This research project has been supported by the Netherlands Heart Foundation (grant No 91.081).

Appendix: The Dutch TMB Study Group


Figures in parentheses represent the number of patients from that centre.

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*J Neurol Neurosurg Psychiatry* 2001 71: 247-249
doi: 10.1136/jnnp.71.2.247

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