Comparison of Clinical Characteristics among Subtypes of Visual Symptoms in Patients with Transient Ischemic Attack: Analysis of the PROspective Multicenter registry to Identify Subsequent cardiovascular Events after TIA (PROMISE-TIA) Registry

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Background: A transient visual symptom (TVS) is a clinical manifestation of transient ischemic attack (TIA). The aim of this study was to investigate differences in clinical characteristics among subtypes of TVS using multicenter TIA registry data. *Materials and Methods:* Patients with TIA visiting within 7 days of onset were prospectively enrolled from 57 hospitals between June 2011 and December 2013. Clinical characteristics were compared between patients with 3 major

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Received January 5, 2018; revision received January 25, 2018; accepted January 31, 2018.

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1052-3057/$ - see front matter

https://doi.org/10.1016/j.jstrokecerebrovasdis.2018.01.031

subtypes of TVS (transient monocular blindness [TMB], homonymous lateral hemianopia [HLH], and diplopia). *Results:* Of 1365 patients, 106 (7.8%) had TVS, including 40 TMB (38%), 34 HLH (32%), 17 diplopia (16%), and 15 others/unknown (14%). Ninety-one patients with 1 of the 3 major subtypes of TVS were included. Symptoms persisted on arrival in 12 (13%) patients. Isolated TVS was significantly more common in TMB than in HLH and diplopia (88%, 62%, and 0%, respectively; $P < .001$). Duration of symptoms was shorter in patients with TMB than those with HLH ($P = .004$). The ABCD^2 score was significantly lower in patients with TMB compared with those with HLH and diplopia (median 2 [interquartile range 2-3] versus 3 [2-4] and 4 [2-5], respectively; $P = .005$). Symptomatic extracranial internal carotid artery stenosis or occlusion was seen in 14 (16%) patients, and was more frequent in TMB than in HLH and diplopia (28%, 9%, and 0%, respectively; $P = .015$). *Conclusions:* TVS was an uncommon symptom in our TIA multicenter cohort. Some differences in clinical characteristics were found among subtypes of TVS. **Key Words:** Transient ischemic attack—visual symptom—risk factor—subtypes.

Introduction

Transient ischemic attack (TIA) is a medical emergency because of the elevated risk of subsequent ischemic stroke. A visual symptom is a major clinical manifestation of stroke and TIA.[1,2] However, public awareness of visual symptoms as a stroke warning sign is low,[3,4] and visual disturbance as a presenting symptom of acute stroke and TIA is associated with longer onset-to-arrival time and decreased action to call 911.[5,6] In a report from Lavallée et al,[7] the most often encountered transient visual symptom (TVS) as a presenting symptom of TIA or minor stroke was transient monocular blindness (TMB), followed by diplopia, and homonymous lateral hemianopia (HLH). TMB is usually associated with significant carotid atherosclerotic stenosis or occlusion.[8,9] Diplopia is a brainstem symptom usually associated with vertigo, dysarthria, or ataxia, and transient diplopia often precedes a posterior circulation stroke.[10] HLH is caused by involvement of the retrochiasmal visual pathway,[11] but transient visual field defect is often under-recognized, and is an uncommon symptom of TIA.[12]

Although TVS is a clinically heterogeneous syndrome, differences in clinical characteristics among subtypes of TVS remain unclear. Therefore, the aim of the present study was to elucidate differences in clinical characteristics among the 3 major subtypes of TVS (TMB, HLH, and diplopia) using data from a multicenter TIA registry, the PROspective Multicenter registry to Identify Subsequent cardiovascular Events after TIA (PROMISE-TIA) Registry.

Materials and Methods

The PROMISE-TIA was a multicenter, prospective, observational study, and the methods were previously described.[13] In brief, patients visiting within 7 days of TIA onset were consecutively enrolled between June 2011 and December 2013 from 57 teaching hospitals certified by the Japan Stroke Society. A diagnosis of TIA was made if focal neurological symptoms ascribable to a vascular etiology lasted less than 24 hours, irrespective of the presence of ischemic insults observed on imaging.[14] Individual attending physicians made clinical management decisions and final diagnosis of TIA. Patients whose symptoms disappeared following intravenous thrombolysis or endovascular therapy were not included. Patients who experienced a stroke in the interval between the visit and registration were included. Patients who were diagnosed as other than TIA after the registration were excluded. Each local ethics committee approved the prospective collection and submission of patients' clinical data to the study office in the National Cerebral and Cardiovascular Center. Written informed consent was obtained from all patients.

The following clinical information was systematically reported: age, sex, body mass index, vascular risk factors including hypertension, diabetes mellitus, dyslipidemia, and previous history of recent TIA (within 90 days), and stroke. Symptoms of TIA were determined by direct interview and neurological examination on admission. In this study, visual symptoms were classified as follows: TMB, diplopia, HLH, and others/unknown. A specialist consultation for the neuro-opthalmological assessment was not mandatory for the classification. Isolated TVS was defined as a TIA presenting only with a visual symptom. The duration of symptom was divided into 3 categories: less than 10 minutes, 10-59 minutes, or greater than or equal to 60 minutes. Time from onset-to-presentation was divided into 5 categories: less than 3 hours, 3-6 hours, 6-12 hours, 12-24 hours, or greater than or equal to 24 hours. The ABCD^2 score was calculated for all patients. Acute ischemic lesions were evaluated by diffusion weighted imaging (DWI). Hyperintense lesions on DWI were defined as the presence of at least 1 lesion consistent with acute cerebral ischemia, but not necessarily responsible for the TIA symptoms. Atrial fibrillation was diagnosed based on electrocardiographic findings on