Differences in Clinical Characteristics between Patients with Transient Ischemic Attack Whose Symptoms Do and Do Not Persist on Arrival

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Background: Symptoms of transient ischemic attack (TIA) persist on arrival and subsequently resolve in some patients admitted to hospitals early after onset. Differences in clinical characteristics between patients with acute TIA whose symptoms do and do not persist on arrival remain unclear. *Methods:* We retrospectively extracted data of consecutive TIA patients with an onset-to-door time (ODT) of 24 hours or less and without a history of stroke from a multicenter TIA database. Clinical characteristics were compared between patients with and without persisting symptoms on arrival. *Results:* Two hundred sixty-six patients (158 men, 68.0 ± 12.9 years) were included. Of the total number of patients, 105 (39.5%) had persisting symptoms with a mean National Institutes of Health Stroke Scale score of 2.4 (median, 1.0). Patients with persisting symptoms were more likely to have sensory disorder, ambulance-transported admission, long-duration TIA (≥60 minutes), and shorter ODT than those without. Multivariate analysis showed that sensory disorder (odds ratio [OR] 2.52, 95% confidence interval [CI] 1.35-4.77), ambulance-transported admission (OR 1.80, 95% CI 1.00-3.28), and long-duration TIA (OR 3.96, 95% CI 2.12-7.71) were positively associated and that an ODT of more than 12 hours (OR .18, 95% CI .04-.63) was inversely associated with the presence of

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persisting symptoms. Patients with persisting symptoms were more likely to be examined by a stroke physician at first (69% versus 57%, $P = .049$) and then hospitalized in a stroke unit (59% versus 43%, $P = .010$). *Conclusion:* Clinical manifestations and management after admission might differ between patients with acute TIA whose symptoms do and do not persist on arrival. **Key Words:** Transient ischemic attack—ABCD^2 score—risk factor—ischemic stroke—persisting symptom.

Introduction

Shortening the time from onset to presentation is crucial for acute treatment and improvement of clinical outcomes in patients with any type of stroke.[1-5] In some patients with transient ischemic attack (TIA) admitted to hospitals early after onset, symptoms persist on arrival and subsequently resolve after admission.[6,7] Weimar et al[6] reported that 57% of patients with TIA admitted to medical centers with acute stroke units within 24 hours of onset had some neurological deficits on arrival, with a mean National Institutes of Health Stroke Scale (NIHSS) score of 1.8 (median, 1.0).

There might be some differences in clinical characteristics between patients with acute TIA whose symptoms do and do not persist on arrival. If symptoms persist on arrival, the symptoms are assessed by physicians and patients will be initially managed as having acute stroke, not TIA. However, in previous studies on TIA, differences in clinical characteristics of patients with acute TIA with and without persisting symptoms on arrival were not extensively evaluated. Therefore, in the present study, we aimed to clarify the differences in the clinical characteristics of patients with acute TIA whose symptoms do and do not persist on arrival using data from a multicenter TIA database.

Materials and Methods

The present study used a retrospective, observational, multicenter TIA database that has been described in detail elsewhere.[8] In brief, consecutive patients with TIA admitted to 13 hospitals with acute stroke units within 7 days of symptom onset from January 2008 to December 2009 were retrospectively enrolled. A diagnosis of TIA was made if focal neurological symptoms with a clinically presumed vascular etiology lasted less than 24 hours, irrespective of the presence of ischemic insults observed on imaging.[9] Patients who received intravenous thrombolysis or endovascular therapy and those who were diagnosed with a TIA-mimicking condition were not included. Each local ethics committee approved the study. In the present study, we selected data of consecutive patients with TIA who arrived at a hospital within 24 hours of symptom onset and without a history of brain infarction or hemorrhagic stroke, which may mask symptomatic manifestations of the current TIA.

The following baseline characteristics were collected from the patients' medical records: sex, age, vascular risk factors (hypertension, dyslipidemia, and diabetes mellitus), atrial fibrillation, history of TIA, prior antithrombotic agents, clinical symptoms of TIA and duration of symptoms, route of arrival (ambulance transport and referral from another medical facility), and onset-to-door time (ODT). Premorbid functional status was estimated by the modified Rankin Scale (mRS). TIA symptoms at onset were categorized into 5 categories: hemiparesis, sensory disorder, speech difficulty, visual disturbance, and others. The duration of symptoms was defined as the time from onset to recovery and classified as either short-duration TIA (lasting for <60 minutes) or long-duration TIA (lasting for ≥60 minutes). ODT was classified as less than 3 hours, 3-6 hours, 6-12 hours, or more than 12 hours. The ABCD^2 score was calculated for each patient.[10]

The presence or absence of persisting symptoms was assessed on arrival by physicians (stroke physician or emergency department physician), and the NIHSS score was determined. All affiliated hospitals had a stroke unit, and patients were hospitalized in the stroke unit, medical emergency ward, or general medical ward. Diffusion-weighted imaging (DWI) was used to evaluate whether acute ischemic lesions were present. The onset-to-imaging time was classified as less than 6 hours, 6-12 hours, 12-24 hours, or more than 24 hours. Acute ischemic lesions were defined as any areas with high signal intensity on DWI. Intracranial and extracranial large-artery atherosclerosis were assessed by carotid duplex ultrasonography, computed tomographic angiography, magnetic resonance angiography, or digital subtraction cerebral angiography. Large-artery atherosclerosis was defined as the presence of more than 50% stenosis or occlusion of the cervicocephalic arteries. Clinical outcomes were evaluated as the occurrence of ischemic events, including the occurrence of brain infarction and recurrence of TIA, during acute hospitalization.

Statistical analysis was performed using JMP 9.0 statistical software (SAS Institute, Inc., Cary, NC). Results are expressed as mean ± standard deviation or median (interquartile range). Patients were divided into 2 groups: those with and without persisting symptoms on arrival. The baseline clinical characteristics, imaging findings, management after admission, and outcomes were compared between the 2 groups. Differences in continuous variables were assessed using the Student *t*-test or the Mann–Whitney *U*-test as applicable. Differences in categorical