

# Clinical Characteristics and Risk Factors for Stroke in Pediatric Transient Ischemic Attack Patients with Moyamoya Disease

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## Introduction

Despite being the most common presentation in pediatric moyamoya patients, TIA in children has rarely been described. The clinical features and risk factors for stroke of these TIAs remain unclear. The aim of the study is to describe the clinical characteristics of the TIA in moyamoya children and study risk factors associated with stroke after TIA.

## Methods

We reviewed 696 consecutive moyamoya vasculopathy patients (155 pediatric patients and 541 adults) admitted to our hospital from 2009 to 2015 to identify pediatric moyamoya patients with initial presentations of TIAs. TIA characteristics were summarized. We defined recurrent TIAs that involve more types of symptoms or symptom extensions as symptom progression. The risk factors for subsequent stroke were analyzed using time-to-event analyses.

## Results

We identified 60 pediatric moyamoya patients with TIA from 693 moyamoya vasculopathy patients referred to our hospital between 2011 and 2015. The mean age of initial presentation was  $10.0 \pm 3.5$  years. Motor weakness ( $n=51$ , [85%]) was the most common symptom in our cohort. Nearly all patients ( $n=55$ , [91.7%]) had recurrent TIA during follow-up. Subsequent strokes were observed in 14 patients (23.3%) during follow-up. We identified the female sex (HR, 5.08; 95% CI, 1.40–18.47;  $P=0.01$ ), Suzuki's grade  $>3$  (HR, 4.01; 95% CI, 1.16–13.82;  $P=0.03$ ), and symptom progression (HR, 5.31; 95% CI, 1.65–17.14;  $P=0.01$ ) as independent predictors of future stroke events.

## Conclusions

TIAs in pediatric moyamoya have a relatively high recurrence rate and are associated with subsequent stroke. We identified the female sex, Suzuki's grade  $> 3$ , and symptom progression as independent predictors of future strokes.

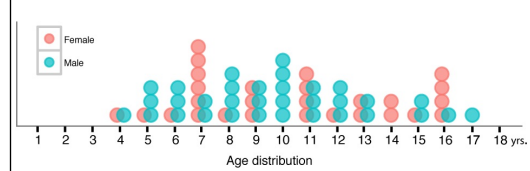
## Learning Objectives

By the conclusion of this session, participants should be able to have a better knowledge of TIA in pediatric moyamoya patients and Identify when and if to perform revascularization for these patients.

## References

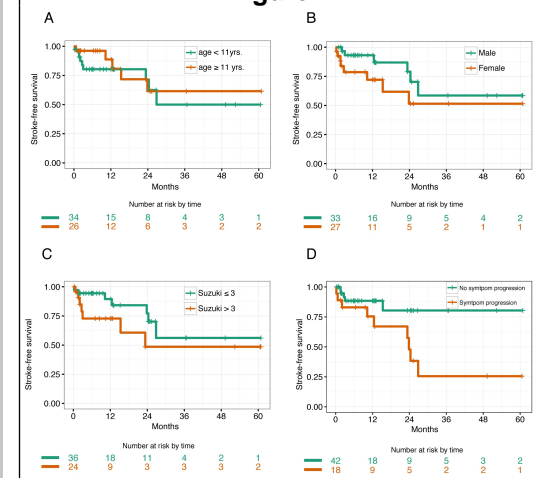
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**Figure 1**



Age distribution of the pediatric TIA patients with moyamoya disease.

**Figure 2**



Kaplan-Meier curves for future stroke-free survival. A: children aged 10 years or younger comparing to adolescent patients (age 11–18); B: female comparing to male patients; C: patients with Suzuki's grade 1–3 comparing to patients with Suzuki's grade 4–6; D: patients who had symptom progression in recurrent TIA comparing to patients who didn't.