Approach to Transient Ischemic Attack in the Emergency Department

Author: Timothy Snow MD (EM Resident Physician, Icahn School of Medicine at Mount Sinai) // Edited by Stephen Alerhand MD

Case presentation

A 45 year-old female with no past medical history is BIBEMS to a level one trauma and stroke urban medical center. The patient presents asymptomatically. However, for a period of 30 minutes approximately 1 hour prior to evaluation, she had experienced an inability to swallow and an inability to raise the left eyelid. She also reports having felt flushed at that time. Symptoms had resolved by the time she was transported to the hospital. EMS report from the scene did not note any focal neurological findings, nor was a stroke code activated on route. While in the ED, she remained asymptomatic. Vital signs were normal. Basic laboratory results were unremarkable. Non-contrast Head CT showed no acute bleeds, and a Neurology consult confirmed no focal neurological findings nor revealed a definitive diagnosis.

We were left with the question of not necessarily finding a definitive etiology (because resolving focal neurological findings were suggestive of a transient ischemic attack), but rather deciding how to properly risk-stratify and disposition this patient.

Background

A Transient Ischemic Attack (TIA) is defined as transient neurological dysfunction caused by ischemia without evidence of infarction. Studies have shown that patients who suffer a TIA have stroke risk of 5% at 2 days and 7% at 7 days. [2] This high risk is relevant to emergency physicians, because it is our job to risk-stratify and safely disposition these patients. If not properly risk-stratified, most physicians would consider 5-7% far too high a risk to safely discharge. To add to this urgency, two independent studies found that there was an 80% reduction in acute stroke when TIA patients undergo immediate evaluation and therapy. [2] There nonetheless exists a relative incongruity amongst emergency physicians who to some extent have a statistical coin flip at disposition, discharging 50% of all TIA patients.

In the Emergency Department, we are inundated with rule out/rule in criteria and risk stratification scores. The question is, do we have an available and validated score for TIA? In 2009 Shah et al did a review published in Annals of Emergency Medicine reviewing the available clinical predictive rules. [2] The one that appeared to be best supported was the ABCD rule (see table 1). There have been 5 validation studies, which have shown a cumulative the risk of stroke was <2% at 7 days consistently when the total score was <4. This rule was given a level 2 rating, meaning that the score can be "used in various settings with confidence and accuracy" and has been supported by accuracy in either one large prospective study or several smaller studies.

ABCD Rule	
Age >60 years	1
Elevated Bp (Systolic >140mmHg or Diastolic >90mmhg)	1
Unilateral Weakness	2
Speech Impairment w/o Unilateral Weakness	1

Symptom duration	
>60 min	2
10-59 min	1
<10 min	0
Total Points	**7**

The ABCD2 simply adds diabetes to the criteria. When the Shah et al meta-analysis was released in 2009, the rule had not been independently validated. In 2014, a meta-analysis by Lee and Shah showed that with a score of <3, there was a 2-day sensitivity for no stroke of 0.89 (0.87–0.92), a 7-day sensitivity of 0.89 (0.87–0.91), and a 90-day sensitivity of 0.87 (0.85–0.89). [1] This, however, does not get us below the 2% threshold that most emergency physicians may be comfortable with.

ABCD2 Rule	
Age >60 years	1
Elevated Bp (Systolic >140mmHg or Diastolic >90mmhg)	1
Unilateral Weakness	2
Speech Impairment w/o Unilateral Weakness	1
Symptom duration	
>60 min	2
10-59 min	1
<10 min	0
Diabetes	1
Total Points	**8**

Furthermore, a scientific statement by the American Heart Association and American Stroke association made the following recommendations: 1) Neuroimaging within 24 hours of symptom onset (preferable MRI). 2) Non-invasive carotid imaging. 3) Stat ECG with possible prolonged cardiac monitoring. 4) General blood labs. 5) Hospitalization is reasonable if <72hrs from symptom onset, ABCD2 score is >3 and neuroimaging cannot be performed within 24 hours. [2]

Case Application

The patient discussed earlier had an ABCD and ABCD2 score of 3. According to the clinical guidelines, she has an ABCD and ABCD2 score <4 which puts her at low risk. If looking at the validation studies of the ABCD2 score, she is not low risk because those studies classified low risk as a score <2.

Summary

When risk-stratifying individuals with potentially serious pathology, the criteria have to be very sensitive and strongly validated. Both the ABCD and the ABCD2 are supported by the literature. The ABCD2 score can be used to improve risk stratification and aid in the disposition of a patient. For example, a patient with a moderate ABCD2 score of 4 should not be sent home if he/she is unable to follow up reliably with a neurologist and is unlikely to get the follow up neuro imaging. Alternatively, a patient with a low ABCD2 score who is very plugged into the system could conceivably follow up with a neurologist within a few days to get an MRI and

further evaluation. He/she could arguably be sent home to continue this workup as an outpatient. As a caveat, these rules should not be used as the sole justification for safe discharge, especially if follow up is uncertain.

References

1. Jarone, L. Shah, K. In Patients Presenting With Transient Ischemic Attack, Does the ABCD2 Clinical Prediction Rule Provide Adequate Risk Stratification for Clinical Decision making in the Emergency Department? Annals of Emergency Medicine, July 2013
2. Shah, K. et al. Clinical Prediction Rules to Stratify Short-Term Risk of Stroke Among Patients Diagnosed in the Emergency Department With a Transient Ischemic Attack Annals of Emergency Medicine, May 2009.