Editorial

Early Stroke Risk After a Transient Ischemic Attack Can It Be Minimized?

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See related article, pages 1717–1721.

Early stroke recurrence after a transient ischemic attack (TIA) or minor stroke, as is becoming clearer lately, is much higher than previously reported. Recent studies found the overall risk to be as high as 8% within a week and up to 20% within a 3-month period.

Along with these observations, numerous studies were published, suggesting different scores and methods aiming to identify those patients, which carry the highest risks. The study by Ois et al., published in this issue of Stroke, addresses this important issue as well.

Yet, with the influx of data—some relating to TIAs only and some mixing TIAs and minor stroke and not all in full agreement—uncertainties have risen. Therefore, there is a need to put some order into the list of risk factors and, more importantly, into the various possible effective means of reducing this high risk.

Risk Factors

Early on, much attention has been paid to the clinical profile of the patients at risk: the California score suggested 5 major factors, while the Oxford area score suggested 4 other, mainly similar, factors (the ABCD2 Score). Other scores exist too, but these 2 have joined forces and recently a consensus was reached resulting in a validated score of 5 factors with 7 points—the ABCD2 score. It consists of the following: A, for age: 1 point for age over 60 years; B, for blood pressure (BP): 1 point for BP over 140/90; C, for clinical features: 2 points for limb paresis, 1 point for dysphasia, none for sensory symptoms only; D, for duration: 2 points for symptoms over 1 hour, 1 point when over 10 minutes, none for less; D2, for diabetes: 1 point when present. Using such a score, the early risk of recurrence was 8.1% at 2 days for those patients with 6 and 7 points. It should be stressed, however, that these scores were developed for TIA patients alone! The duration factor, for instance, is useless for minor stroke patients!

These and other studies have also dealt with 2 other important factors: the underlying etiology and the impact of the radiological findings.

The underlying etiology is of major importance: The presence of large artery disease (LAD) and in particular high grade (≥70%) carotid stenosis has been known to carry an early poor prognosis; the best treatment (ie, carotid endarterectomy [CE]) is highly beneficial only when carried out within 2 weeks after the ischemic event, and earlier risks were associated when TIA (not stroke) was the qualifying event. In such cases CE can be done without any delay because there is no danger to cause an early reperfusion injury in a recent brain infarct. In the present article LAD was identified to be the most important predictor of stroke recurrence within 3 months carrying an odds ratio of almost 5! In a recent analysis of the OXVASC and OCSP studies together, the stroke risk with LAD was found to be 12.6% within 1 month and 19.2% within 3 months.

Second to this etiology is the risk associated with cardioembolism, which has been recently estimated to be 4.6% in the same analysis within a month. The relatively low risk of the cardioembolic etiology (also somewhat in contrast with former knowledge) could stem from the fact that all mechanisms were lumped together while not all cardiac sources of emboli carry the same risk. The most common ones, ie, atrial fibrillation and severely diseased or replaced valves (mainly the mitral), however, carry higher risks, especially with the (overall) uncertainty that still exists whether to start anticoagulation immediately in order to reduce the risk of recurrent embolism or withhold it for a period of time in order to prevent hemorrhagic transformation of the fresh brain infarct and other intracranial bleeds.

Brain imaging findings were also considered important in assessing the stroke recurrence risk. CT or MRI findings of previous or recent infarcts were found to correlate with higher early risks. This factor mainly applies to TIA patients. A recent article suggested that adding the emergency room CT findings to the ABCD score augments its impact in identifying those patients with the highest risks. Other clinical and historical factors exist too (eg, history of prior TIA, heart failure or high alcohol intake), but urgent confirmation of their existence may not be feasible.

Means to Reduce the Risk

Now that we more fully understand how to identify most patients at high risk, we still face a bigger challenge: what should be done in order to reduce the risk? One option is to admit the patient to the hospital. This is probably associated with earlier investigations and treatment and thus with reduced morbidity. Another reason for admitting patients with TIAs is the ability (should we fail to prevent stroke) to administer tissue plasminogen activator earlier and thus improve stroke outcome. Clearly, there is a need to hasten investigations (in particular...
carotid duplex or other vascular imaging) but this doesn’t necessarily mean admission to hospital. The use of noninvasive vascular imaging and angiography (either by CT angiography or by MR angiography) is common nowadays and should be part of the initial brain imaging.

Early comprehensive medical treatment seems to be the key to early success: the EXPRESS study, recently published, has demonstrated that easy access to dedicated TIA clinics, where intense medical treatment was introduced immediately after an urgent brain CT scan (if needed), reduced the early risk by 80%.15

**Conclusions**

TIAs and minor strokes carry a very high and early stroke risk. Clinical features and etiologic and imaging factors, which are associated with higher risk, have been identified. I may add that it is a pity that clinical findings (such as carotid bruit, cardiac arrhythmia or murmur) were not assessed as well. The full “clinical only” scores are applicable to TIA patients only. Yet these factors by themselves are not enough, because the key issue in reducing stroke risk is the speed of response to the ictus: earlier presentation to dedicated physicians (whether in a clinic or in the hospital) and earlier intervention seem to be the most beneficial approach to all TIA patients. Whether selection of patients according to their risk profile is associated with a more favorable outcome needs to be proven by further studies.

**Suggested Approach**

For the time being, on the basis of the present knowledge I suggest the following approach:

1. **For TIA patients:**
   A. At the doctor’s office: The ABCD2 score should be applied. Those scored 6 and 7 should be referred immediately to the hospital for prompt investigation and treatment. Urgent administration of antiplatelet agents should be considered at the doctor’s office. If a nearby, well equipped TIA clinic exists it could serve as an alternative, especially if the scores are somewhat lower and if no significant clinical signs are present (irregular pulse, signs of heart failure, clear carotid bruit etc). Those with the lowest score with no abnormal clinical findings can be treated and investigated at a somewhat lower pace (ie, by the primary care physician).
   B. At the TIA clinic similarly the ABCD2 score should be applied, clinical signs should be taken into account and the speed of imaging should be decided accordingly. Comprehensive treatment should be started (including for stroke risk factors as appropriate). If some imaging facilities are missing when urgently needed, referral to the hospital should be considered.

2. **For minor stroke patients:** These patients should be referred to the hospital for prompt investigation, treatment and follow-up. Here also the ABCD2 score and the clinical findings should guide the urgency and sequence of the use of the various investigational tools. Patients with significant carotid stenosis should be presented without delay to the vascular surgeon for immediate action. Exceptions (nonadmission) could be made only if brain imaging is available immediately and likewise means for further investigating and following up the (medically treated) patient exist.

Not less important are continuous efforts to increase patients’ knowledge regarding symptoms and signs of TIA and stroke and a parallel effort to increase the number of stroke clinics or other equipped facilities with easy access to the public. These approaches and guidelines seem to be the best available solutions.

**Disclosures**

None.

**References**


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