Have Stroke Neurologists Entered the Arena of Stroke-Related Cognitive Dysfunctions? Not Yet, but They Should!

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In this issue of Stroke, Zamboni et al1 reported the results of a study that explored whether early cognitive impairment was associated with the volume of white matter hyperintensities and with white matter damage on diffusion-weighted magnetic resonance imaging in patients with transient ischemic attack (TIA) or minor stroke. Cognitive evaluation was performed with the 2 currently most widely used screening tools, the Montreal Cognitive Assessment (MoCA) and the Mini Mental State Examination. Scores on both tests, 1 month after the event, were significantly correlated with volume of white matter hyperintensities and fractional anisotropy values. However, only the MoCA was independently correlated with white matter hyperintensity volumes, average fractional anisotropy values, and reduced fractional anisotropy in anterior tracts after controlling for the Mini Mental State Examination.

This study reinforces the idea that the MoCA is better suited than the Mini Mental State Examination for the assessment of patients with cerebrovascular diseases.2 These data are also in agreement with previous studies showing that the MoCA is more specifically associated with microstructural damage in white matter than the Mini Mental State Examination.3

Some issues, such as the appropriate normality cutoffs for these tests, remain open, but these studies, however, have the great merit of raising a series of relevant points concerning the cognitive costs of cerebrovascular diseases.

Cognition After Stroke: Magnitude of the Problem

Cognitive dysfunction is among the most common and severe consequence of stroke. For patients and their caregivers, cognition and related disturbances are among the top 10 priorities related to life after stroke.4

In hospital series, poststroke dementia prevalence can be as high as 40% depending on inclusion of recurrent strokes, time of evaluation after stroke, dementia criteria, and exclusion of aphasic patients.5 The magnitude of the problem is even larger considering that many stroke patients develop cognitive deficits that do not meet criteria for dementia (ie, mild cognitive impairment); this percentage can be as high as 80%.6 Finally, >90% of stroke survivors complain of subjective cognitive impairment.7 These complaints may benefit from objective testing.8

The presence of cognitive deficits has several consequences after stroke. Importantly, it may heavily affect rehabilitation strategies.9 Early poststroke cognitive dysfunction, together with stroke severity and prestroke functionality, is a significant and independent predictor of long-term functional poststroke outcome.10

In this era where a great focus and vast efforts are placed on acute stroke and on the treatments available in this phase, it is interesting to compare the above-mentioned data with the figures of stroke patients subjected to thrombolysis. Estimates of alteplase treatment range from 3% to 5%,11 with eligibility estimates approaching 10%. Optimistically, patients eligible for endovascular thrombectomy could be 7%,12 but current performance rates are significantly lower. Remarkably, all stroke patients can clearly benefit from admission to a dedicated stroke unit.

It is obvious that although the acute-phase therapies are cornerstones of our care of stroke patients and, on an individual patient basis, they may change dramatically the outcome, the bulk of stroke problems remain in the chronic phase.

Stroke Neurologist Are Called to Assess Cognition

Despite the impressive data on the frequency of the stroke cognitive consequences, this topic has received scarce attention to date. One systematic review of published stroke trials pointed out that, out of almost 9000 studies, <5% included a cognitive measure.13

The evaluation of the patient’s cognitive abilities has always been part of the neurological examination, and neurologists had been skilled in this for years. However, this part of the neurological examination is complex, requires experience, and takes time. Today, we are frequently called to quickly visit stroke patients especially in specific settings such as in the acute phase when time-dependent decisions need to be made. Brief and time-convenient neurological scales have, therefore, been developed, the best example being the National Institute of Health Stroke Scale. The National Institute of Health Stroke Scale has great advantages such as the implementation of a standardized scoring measure and use of a common language among centers. These scales are so widely used in the stroke setting that there is a tendency for them to entirely replace the full neurological examination. There are clear hazards in such oversimplification. One is that these scales are heavily weighted on more easily evaluable deficits such as motor, whereas cognitive evaluation, besides language items, is minimalized.
Tools for the Evaluation of Cognition After Stroke

Thus, the evaluation of cognition should clearly become part of the neurological assessment of all stroke patients. Some of the open issues in this regard concern the time of the evaluation and the tools for it. A thorough cognitive assessment requires time as cognitive domains are various (language, memory, attention, executive function, visuospatial, etc).

Many cognitive instruments have been proposed for the evaluation of stroke patients. These tools should be selected according to the different intervals of assessment after stroke and the availability of time and personnel. In any case, we need tools to systematically assess cognition in stroke patients and instruments that are usable from the early phases.

The MoCA could be one of such tools. Its use for the assessment of cerebrovascular disease patients has been advocated because it evaluates many of the cognitive domains affected in these patients. The MoCA has been tested in several studies in the acute stroke setting where it is applicable and predictive of long-term outcome. The MoCA has advantages and limitations as does any other cognitive tool under investigation for use in acute stroke. More important than the issue of the finding of the best tool (likely to be an impossible task) is attention to the evaluation of cognition in stroke patients.

Is It a TIA or a Cognitive Stroke?

One last interesting issue raised by the study by Zamboni et al is the fact that some cognitive impairment was found in TIA patients 1 month after the event. TIA symptoms by definition must last <24 hours, so finding a clinical deficit at a time distant from onset could challenge the concept of TIs being transient.

There are at least 2 possible explanations for such findings. The first is that the vascular event clinically diagnosed as TIA induces a cerebral damage that is transient in its noncognitive expression but that is sustained for cognition. Indeed, it is well documented that some TIs are associated with permanent brain lesions. This damage might also happen at a microstructural level and be invisible on conventional neuroimaging. Alternatively, one may hypothesize that, in TIA patients, brain microstructural damage and functional dysfunction are present before the event. White matter damage as shown in the study by Zamboni et al could be one of the correlates of this cognitive decline. The answer to this question can come from longitudinal imaging studies, cognitively assessing subjects before the cerebrovascular event and then afterward. However, these are not easy to conduct.

Ten years after the call for vascular neurologists to enter the arena of poststroke cognition to fight the hard problem in daily life after a stroke, the consideration given to this aspect remains limited. We urge stroke clinicians to increase their attention toward the cognitive and long-term consequences of stroke.

Disclosures

None.

References

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