

# Could side of middle cerebral artery obstruction be a prognostic factor for mortality in thrombolysed patients?

Poderia o lado da obstrução da artéria cerebral média ser um fator para o prognóstico de mortalidade nos doentes trombolizados?

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**T**reatment with thrombolytic therapy in ischemic stroke is effective and safe but data on its safety and efficacy in different stroke subtypes and etiologies is lacking. Different parameters can influence the effectiveness and risk of thrombolysis in stroke patients and knowledge of these factors can be useful to inform therapeutic decisions, often involving actions outside the general consensus or decisions based on risk/benefit. This information may also be useful as a prognostic element and help guide rehabilitation conduct. Among the numerous parameters that can be analyzed, laterality of the arterial territory affected represents a favorable element which is readily and quickly assessed. Cerebrovascular events often cause neuropsychological deficits that are related to the side of the stroke, for example, aphasia in the left cerebral hemisphere (LCH) and neglect in the right cerebral hemisphere (RCH).

RCH strokes are often underestimated by clinical rating scales<sup>1,2</sup> because deficits such as language disorders (typical of the LCH) are more easily recognized than neglect or agnosias, typical of the RCH<sup>2,3</sup>. Imaging studies show that RCH stroke patients can be rated lower by the NIH scale, despite having a large cerebral infarct area<sup>3,4</sup>. Stroke severity, as measured by the NIH scale, an internationally accepted instrument, is one of the criteria used for patient selection. The scale could be adjusted by hemisphere affected for a more accurate assessment of patient hemorrhage risk<sup>1</sup>, should the hypothesis of a relationship between laterality and severity be proven. These factors may contribute to less frequent thrombolysis of RCH stroke patients who consequently do not receive adequate treatment. Difficulties detecting symptoms of RCH stroke are challenges which must be overcome in order to optimize conduct, particularly during the acute phase of stroke.

The topographic relationship regarding the side of the middle cerebral artery affected (right or left) can represent a further element contributing to risk assessment and quantification of prognosis. The issue remains controversial in the literature<sup>1,5,6,7</sup> and warrants further analyses.

Brain hemorrhage after thrombolysis is the most feared complication of the procedure<sup>2,8</sup> and studies analyzing possible predictors of risk are of great clinical interest.

Sato et al.<sup>5</sup>, in a study analyzing a large casuistic (2708 patients with supratentorial hemorrhage) found a higher death rate in right-sided stroke but no effect of laterality on severity of sequelae among survivors. Audebert et al.<sup>1</sup> stated that the higher hemorrhage rates in RCH stroke reported were due to bias introduced by the scales employed.

Brott et al.<sup>9</sup> found a 15% higher incidence of silent infarction in RCH compared to LCH; patients with previous silent stroke may have poorer prognosis after thrombolysis, a finding which, if confirmed, can be used as an auxiliary criteria to guide patient conduct.

The study of Ducci et al.<sup>10</sup>, "*Does the side of middle cerebral artery compromise matters in the mortality after thrombolysis in ischemic stroke?*", published in this edition, addresses this interesting yet little studied aspect. The authors compared groups that were similar for risk factors and ischemic stroke types in a Brazilian cohort. Specific racial and ethnic groups are known to have predominance for injury in different locations (cervical arteries in Caucasians and intracerebral arteries in Asians<sup>11</sup>). Thus, although not homogeneous for race and ethnicity, this report on a Brazilian population is valuable. A detailed investigation

into the characteristics of the artery involved in the stroke would also be elucidating, since atherothrombosis with unstable and/or complex plaques carries a higher risk of hemorrhage compared to embolisms. A study of the arteries using the multidetector computed tomography angiography method, which has proven useful for this purpose<sup>12</sup> may, in future investigations, contribute to better etiological and physiopathological definition. Akin to all retrospective studies, the investigation by Ducci et al.<sup>10</sup> has some inherent bias, such as the fact that some patients may not have been included due to missing data. Golsari et al.<sup>7</sup>, in a recent study involving patients thrombolysed due to stroke, quantified stroke and infarct volume using diffusion magnetic resonance imaging.

The authors analyzed evolution over three months (using the modified Rankin scale), comparing groups with RCH and LCH strokes. No difference in severity for stroke side was found but a difference in volume of tissue affected was identified. This result may explain the findings of Ducci et al.<sup>10</sup> The fact that the Ducci et al.<sup>10</sup> study analyzed only thrombolysed patients allows its conclusions to be used as criteria for indicating thrombolysis. This can contribute to the selection of candidates for thrombolysis, inferring that the side of stroke should not be prioritized as an inclusion and/or exclusion criteria and that clinical care and rehabilitation should be established and followed independently of side affected, thereby preventing underdiagnosis of patients with RCH strokes.

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