Thrombolysis for Acute Stroke in Pediatrics

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Thrombolysis with tissue plasminogen activator (tPA) for patients with acute stroke began in the eighties. After several small series and some pilot trials, the National Institute of Neurological Disorders and Stroke (NINDS) study was the first randomized, controlled, double-blind trial that demonstrated with evidence the efficacy and safety of intravenous tPA in acute stroke. However, in all these studies the 3 usual groups of patients: pregnant women, old men and children were excluded on ethical grounds. Therefore, they were also excluded from clinical practice since tPA was approved.

Stroke is an infrequent condition in pediatrics and the etiological subtype distribution is different in children to adult patients. For example, prothrombotic factors account for 68% of strokes in newborns, and for 56% in infants and children. Other etiologies more frequent in children than in adults are: congenital heart malformations, vascular abnormalities, infectious diseases or some rare metabolic problems. In most of these conditions (cardioembolic, infective), the formed thrombus is fresh and rich in fibrin, the better for the recanalization with tPA.

Despite the fact that “less than 18 years of age” is an exclusion criterion for thrombolysis, in recent years some pediatric cases have been published. Most of them are intra-arterial thrombolysis with tPA or urokinase and sometimes plus intracranial angioplasty. Moreover, several patients are already young adults (15 to 18 years of age). Although the cases are diverse, the neurological recovery was complete in all of them and neither death nor symptomatic intracranial hemorrhage was reported.

The excellent article by Janjua et al provides us with the first national register of thrombolysis in children. It is a retrospective study that analyzes 20% of all community hospital admissions in the United States. Over a 4-year period, 2904 pediatric patients with stroke were included in the study, with <2% of them receiving intravenous or intra-arterial thrombolysis. After reading the article, we can establish 3 ideas about thrombolysis in children:


**Key Words:** pediatric stroke, tPA
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Stroke. 2007;38:1722-1723; originally published online April 12, 2007;
doi: 10.1161/STROKEAHA.107.487116
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0039-2499. Online ISSN: 1524-4628

The online version of this article, along with updated information and services, is located on the
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