

# A new era in the management of intracerebral hemorrhage is approaching

## Se acerca una nueva era en el tratamiento de la hemorragia intracerebral

Manuel E. Torres-Pérez and Miguel García-Grimshaw\*

Stroke Clinic, Department of Neurology and Psychiatry, Instituto Nacional de Ciencias Médicas y Nutrición Salvador Zubirán, Mexico City, Mexico

Intracranial hemorrhage (ICH) prevalence has increased since the 1990s in Mexico, especially among young adults (< 50 years)<sup>1</sup>. During the past years, there have been noteworthy advances in the acute management of ischemic stroke, modifying the natural history of this devastating disease<sup>2</sup>. Despite being equally important, ICH is currently perceived as far from showing similar progress, probably due to poor outcomes obtained in most clinical trials and the catastrophic scenarios derived from the current predictive scores, which have sometimes led to discouraging aggressive medical care from the clinical, neuro-interventional, and neurosurgical communities<sup>3</sup>.

ICH clinical trials during the past decade have aimed at limiting hematoma expansion, a well-established factor associated with poor clinical outcomes<sup>4</sup>. Most trials have focused on acute intensive blood pressure (BP) control with positive results, as recently demonstrated by the Intensive Ambulance-Delivered Blood-Pressure Reduction in Hyperacute Stroke Trial (INTERACT4), which showed a decrease in the odds of a poor functional outcome (odds ratio 0.75; 95% confidence interval 0.60-0.92) with a target of systolic BP between 130 and 140 mmHg<sup>5</sup>.

Besides BP management, temperature, and glucose control are other factors that can improve clinical outcomes, as well as a rapid and goal-directed anticoagulation reversal<sup>6</sup>. The latter is quite relevant in

the era of direct oral anticoagulants, especially with the positive results of the ANNEXA-I trial, which showed that among patients with anticoagulation-related ICH, the use of andexanet, a factor Xa inhibitor, resulted in better control of hematoma expansion than usual care<sup>7</sup>. Still, real-life evidence and affordability (especially for low and middle-income countries) analyses are needed, in addition to studies comparing andexanet versus the use of prothrombin complex concentrates.

Until 2024, the role of surgery in ICH has been controversial due to the minimal or null functional benefit of surgical drainage. The Early Minimally Invasive Removal of Intracerebral Hemorrhage (ENRICH) trial has proven the benefits in functional outcomes at 180 days of an early (within 24 h) trans-sulcal minimally surgical technique for lobar hematoma evacuation, the median volume of 54 mL (interquartile range [IQR] 39-72)<sup>8</sup>. Furthermore, the SWITCH study showed that decompressive craniectomy (within 24 h) plus the best medical treatment might be superior to the best medical treatment alone in severe (median volume 55 mL, IQR 45-74) deep ICH (basal ganglia and thalamus) at 180 days<sup>9</sup>.

The statement that time is brain is also valid for patients with ICH. The imperative of timely intervention is equal or even greater for this pathology. Therefore, based on the successful experience accumulated in

### \*Correspondence:

Miguel García-Grimshaw

E-mail: miguel.garciag@incmnsz.mx

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other domains of neurology, the early combined care model in ICH focused on BP control, glucose, temperature, and anticoagulation reversal, plus the recent positive and encouraging results of the aforementioned trials, which may be supported by future and ongoing minimally invasive surgery trials (ClinicalTrials.gov numbers: NCT05681988, NCT02661672, NCT03342664, NCT04434807)<sup>10</sup>, we firmly believe that a new era in the management of ICH is approaching.

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