Anti-cancer drug could improve symptoms after stroke

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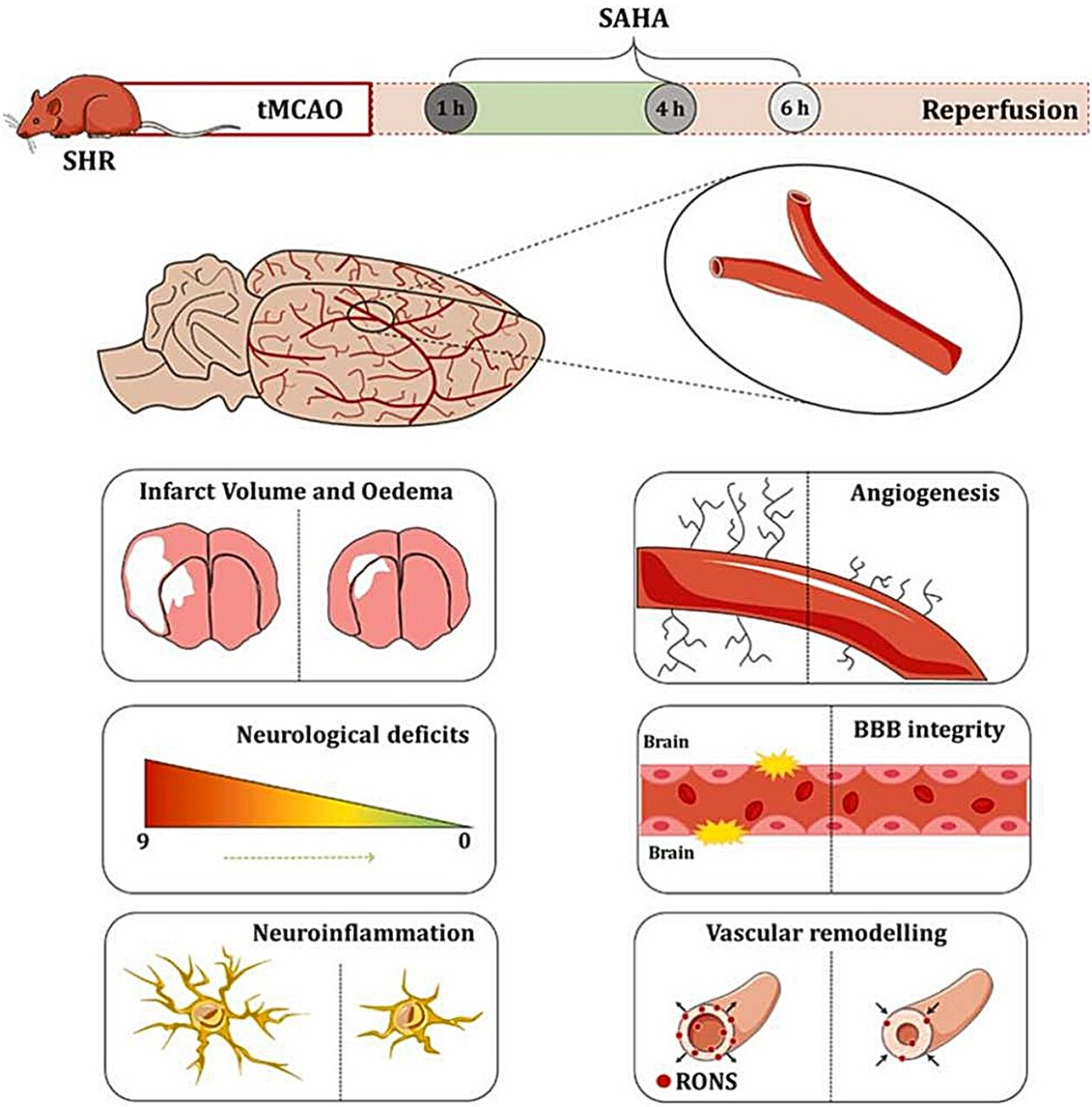

Graphical Abstract. Credit: *Biomedicine & Pharmacotherapy* (2024). DOI: 10.1016/j.biopha.2024.116287

A study by the Institut de Neurociències of the UAB (INc-UAB) demonstrates in animal models the benefits of vorinostat after having suffered a stroke. The drug, used in humans to treat cutaneous T-cell lymphoma, has been proven to mitigate brain injuries and help in restoring brain tissue.

Ischemic stroke is the second leading cause of death worldwide and occurs when blood flow cannot reach the brain due to an obstruction. For a more or less long period of time, the brain does not receive oxygen, and this causes damage and functional impairment. Hypertension is the most frequent modifiable risk factor for stroke and is associated with worse recoveries.

Currently, there is only one pharmacological treatment to attenuate the effects of stroke, but it does not work for all patients and is associated with some important adverse effects. Now, researchers at the Institut de Neurociències of the UAB (INc-UAB) were able to demonstrate that vorinostat (suberoylanilide hydroxamic acid) has great potential in treating brain lesions derived from strokes.

This drug, used in the treatment of one type of cutaneous lymphoma, inhibits histone deacetylases, enzymes that regulate gene expression by modifying the acetylation levels of a group of proteins called histones.

In an article published in the journal *Biomedicine and Pharmacotherapy*, the research group demonstrates, in a model of stroke in hypertensive rats very close to the clinical situation, how the use of the drug helps the

animals to improve neurological deficits, reduce brain damage and attenuate the inflammatory response, among other effects.

"We saw that a single dose of the drug, applied during the reperfusion period, prevented multiple factors associated with stroke pathology. This opens the path for research with this type of treatment beyond the preclinical phase," explains Andrea Díaz, first author of the article.

In addition, researchers were able to demonstrate that the treatment not only protects the brain but also the surrounding vessels and does so even a few hours after the stroke occurs.

"Given the urgent clinical need for drugs to treat acute ischemic stroke, and that vorinostat is approved for human use, these findings should encourage further preclinical research to evaluate, for example, its effects in females and older animals, in animal models with other common stroke comorbidities such as diabetes, its long-term effects, etc."

"This would pave the way for the correct design of future clinical trials to test its efficacy and safety in patients who have suffered a stroke," concludes study coordinator Francesc Jiménez-Altayó, a researcher from the Department of Pharmacology, Therapeutics, and Toxicology at the UAB and the Cardiovascular Diseases Area of the Centre for Biomedical Research Network (CIBERCV).

More information: Andrea Díaz-Pérez et al, Histone deacetylase inhibition by suberoylanilide hydroxamic acid during reperfusion promotes multifaceted brain and vascular protection in spontaneously hypertensive rats with transient ischemic stroke, *Biomedicine & Pharmacotherapy* (2024). DOI: 10.1016/j.biopha.2024.116287