IMPACT PROFILE

Reducing Inflammation for Stroke Patients with Vagal Nerve Stimulation

Translational Science Benefits Model

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Investigating treatments to lessen inflammation after an acute ischemic stroke.

The Challenge

Inflammation plays a critical role in brain injury following acute ischemic strokes (AIS). Vagal nerve stimulation, a therapy that uses electrical impulses to stimulate the vagus nerve, reduces inflammation in nonhuman studies. Transcutaneous nerve auricular vagus nerve stimulation (taVNS), a type of vagal stimulation, is a noninvasive treatment for brain injury following a stroke. taVNS has shown to reduce inflammation in various conditions, but its efficacy in AIS remains unexplored. We investigated if taVNS can lessen inflammation after a large vessel occlusion (LVO) AIS and if it is safe to use.

The Approach

The randomized controlled NUVISTA trial aimed to:

- Assign LVO AIS patients to twice-daily taVNS or sham stimulation for five days or until discharge.
- Assess the effect of taVNS on inflammatory blood biomarkers and taVNS safety.
- Study the effect in functional outcomes.

The Impact

The NUVISTA trial demonstrated that taVNS, when added to standard medical care, safely and effectively reduced the post-AIS inflammation in patients with LVO AIS. Patients receiving taVNS quickly after stroke symptom onset showed significantly faster reductions in inflammatory blood biomarkers, most notably in interleukin-6 (IL-6). In addition, a reduction in inflammatory biomarkers correlated with a reduction in post stroke disability. This randomized pilot trial demonstrated that taVNS may aid in mitigating the inflammatory sequelae associated with LVO AIS and may reduce neurologic complications and morbidity due to LVO AIS. If our findings are confirmed on a larger clinical trial, this would provide a new treatment for stroke patients that is safe and easily deployable.

RESEARCH HIGHLIGHTS

Neuromodulation **U**sing **V**agal Nerve Stimulation for **I**schemic **S**troke as a **T**herapeutic **A**djunct (NUVISTA): Results of the Randomized Clinical Trial NUVISTA

- taVNS **safely reduced** inflammatory blood biomarkers, in particular IL-6, when compared to sham.
- taVNS **potentially improves stroke functional outcomes**.

Key Benefits

The *Reducing Inflammation for Stroke Patients with Vagal Nerve Stimulation* project resulted in the following **Investigative and Therapeutic Procedures benefits** under the **Clinical** domain:

Reduces inflammatory blood biomarkers in LVO AIS, particularly IL-6. (*Demonstrated)*

Improve neurological functional outcomes for large stroke patients. (*Potential*)

Demonstrated the safety of taVNS. (*Demonstrated*)

Reduces complications associated with AIS. (*Demonstrated)*

Serve as a potential adjunctive therapy for AIS patients. (*Potential)*

The team:

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- Full NUVISTA Team in link below.

Find out more:

https://www.medrxiv.org/content/10.1101/2025.03.06.25323500v1

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