NON-INVASIVE VAGUS NERVE STIMULATION IS SAFE AND EFFICACIOUS IN THE TREATMENT OF HEADACHE ASSOCIATED WITH SUBARACHNOID HEMORRHAGE (VANQUISH)

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Abstract

Background and Aims

Vagus nerve stimulation (VNS) has been shown to reduce inflammation involved in headache pathogenesis in subarachnoid hemorrhage (SAH). We hypothesize that non-invasive transcutaneous stimulation of the cervical branch of the vagus nerve (nVNS) is safe and efficacious in the treatment of headache in SAH.

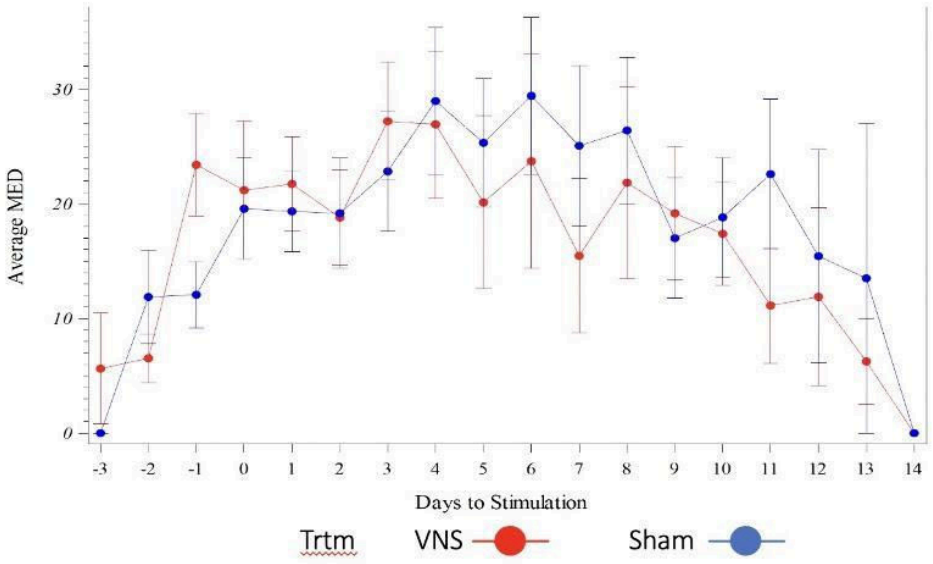
Methods

A total of 40 patients with SAH were randomized in this sham-controlled, double-blind study. Patients received two-two-minute stimulations with nVNS, every 5 hours. Daily morphine equivalence dosage (MED) was recorded. Visual analog scale, vital signs, and cardiac rhythm were assessed before and after each stimulation.

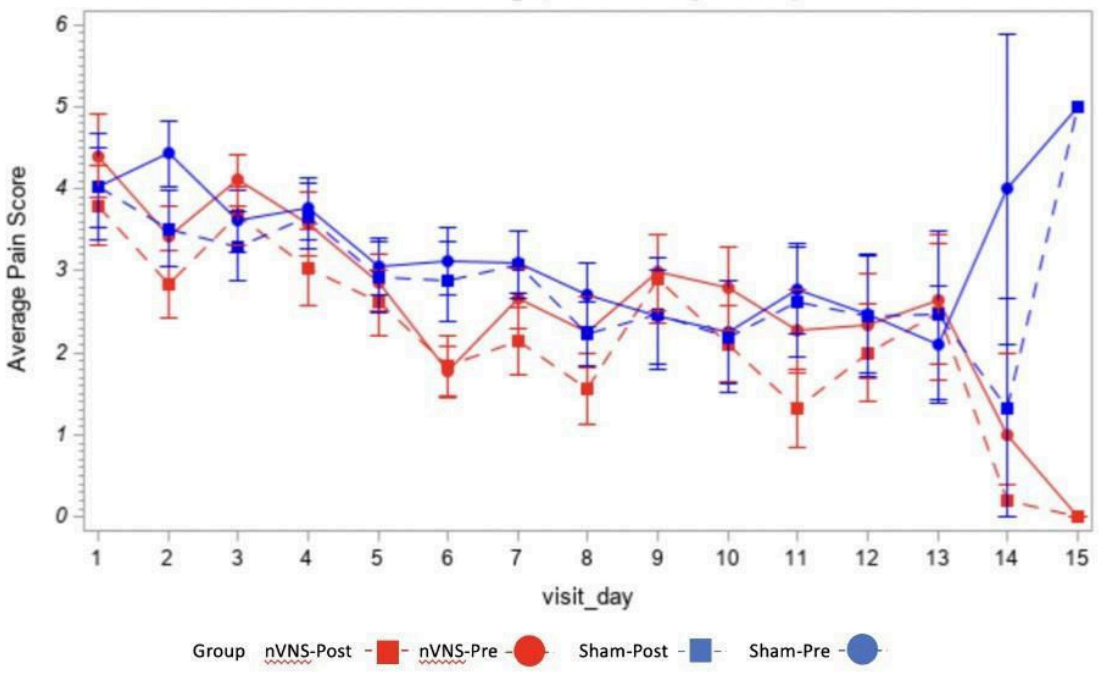
Results

There was a 10% reduction in mean MED at 7 days (21.99 mg [21.419 mg] vs 24.29 mg [20.11 mg], p=0.935) and 14% at 14 days (19.91mg [19.13 mg] vs 23.21 mg [18.06 mg], p=0.794). Moreover, there was a significant reduction in the overall pain score in the active compared to the sham group (p =0.005). The between group difference least square mean was -0.47 (SE 0.15), a reduction of 17.7% in post stimulation pain score. There was no statistically significant difference in the vital signs or rate of arrythmia between the treatment groups. There was a clinically significant decrease in mean hospital length of stay of 2 days in the VNS group.

Average Morphine Equivalence Dosage (MED) by Hospital Day



Average Pain Score by Hospital Day



Conclusions

There was a trend towards less MED usage that was clinically meaningful and a significant drop in headache intensity in the VNS group. VNS is safe and well tolerated in patients with SAH. A larger trial is warranted to define the potential efficacy of nVNS in SAH.