

Non-invasive vagus nerve stimulation (taVNS) reduces anxiety and depression in patients with chronic diseases.

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Introduction: Anxiety and depression are common comorbidities in chronic diseases. They exacerbate

the perception of physical symptoms, impair quality of life, and are associated with poorer prognosis. Invasive vagus nerve stimulation has demonstrated efficacy in severe mood disorder but remains limited in routine clinical practice. Transauricular non-invasive vagus nerve stimulation (taVNS) represents a promising alternative whose impact on anxiety and depression in chronic conditions warrants further investigation.

Material and Methods: To evaluate the efficacy of a standardized taVNS protocol on anxiety and depressive symptoms in patients with chronic pain conditions. A series of 143 consecutive patients with chronic pain conditions referred to our neuromodulation center were included. All patients received standardized taVNS consisting of one 60-minute session per week for 8 weeks. Anxiety and depressive symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS), including HADS-A and HADS-D subscales, from baseline (W01) to week 8 (W08), with weekly evaluations.

Results: Among the 143 patients, 13 had CANVAS (Cerebellar Ataxia, Neuropathy, Vestibular Areflexia Syndrome), 20 had Ehlers-Danlos syndrome, 20 had ankylosing spondylitis and 90 had restless legs syndrome. Mean HADS-A scores significantly decreased between W01 and W08 ($10,00 \pm 4,41$ vs $7,52 \pm 4,35$; $-24,8\%$; $p < 0,0001$; $d = 0,566$). Similarly, mean HADS-D scores showed a significant reduction ($6,81 \pm 4,22$ vs $5,66 \pm 4,33$; $-16,9\%$; $p < 0,0001$; $r = 0,705$).

Discussion/Conclusion: taVNS is associated with a significant reduction in anxiety and depressive symptoms in patients with chronic pain conditions. These preliminary findings support the need for larger randomized controlled trials to confirm these results.

Keywords: taVNS; anxiety; depression; HADS; chronic diseases; pain; neuromodulation; vagus nerve

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