Occipital nerve stimulation (ONS)

Stimulation of the occipital nerve is a modality for the treatment of chronic migraine, with greater than 50% pain reduction in approximately 80% of patients in open-label trials and ~40% of patients in randomized controlled trials. [1].

How ONS affects sensory thresholds and whether modulation of thresholds could predict which patients respond to the therapy remains unclear.

It seems to decrease migraine-related headache intensity by modulating activity in areas involved in processing the affective, emotional, and cognitive aspects of pain as well as the anticipation of pain [2].

De La Cruz et al show that ONS improves mechanical thresholds in a rodent CM model, but not in shams. The finding that mechanical but not thermal thresholds are altered with ONS suggests a more significant modulation of A-α/β fibers than of C fibers. Assessing the ability of ONS to reduce mechanical thresholds during a trial period could potentially be used to predict which patients respond [3].

Jennifer Sweet et al. conducted a systematic literature search using the PubMed database and the Cochrane Library to locate articles published between 1966 and April 2014 using MeSH headings and keywords relevant to ONS as a means to treat occipital neuralgia. A second literature search was conducted using the PubMed database and the Cochrane Library to locate articles published between 1966 and June 2014 using MeSH headings and keywords relevant to interventions that predict response to ONS in ON. The strength of evidence of each article that underwent full text review and the resulting strength of recommendation were graded according to the guidelines development methodology of the American Association of Neurological Surgeons/Congress of Neurological Surgeons Joint Guidelines Committee.

Nine studies met the criteria for inclusion in this guideline. All articles provided Class III Level of evidence.

Based on the data derived from this systematic literature review, the following Level III recommendation can be made: the use of ONS is a treatment option for patients with medically refractory ON [4].

Occipital Nerve Stimulation for Medically Intractable Cluster Headache

Occipital nerve stimulation for cluster headache

1)
Tavanaiepour D, Levy RM. Peripheral neuromodulation for treatment of chronic migraine headache. Neurosurg Clin N Am. 2014 Jan;25(1):11-4. doi: 10.1016/j.nec.2013.08.010. Epub 2013 Oct 7. PubMed PMID: 24262895.
2)
Clark SW, Doucet GE, Venkatesan L, Wu C, Mehdi M, Intenzo C, Silberstein S, Sharan AD. 187 Comparison of Neural Activation in Chronic Migraine Patients During Optimal and Suboptimal Occipital Nerve Stimulation: A PET Imaging Study. Neurosurgery. 2015 Aug;62 Suppl 1:228. doi:

10.1227/01.neu.0000467151.75547.07. PubMed PMID: 26182033.

3)

De La Cruz P, Gee L, Walling I, Morris B, Chen N, Kumar V, Feustel P, Shin DS, Pilitsis JG. Treatment of Allodynia by Occipital Nerve Stimulation in Chronic Migraine Rodent. Neurosurgery. 2015 Sep;77(3):479-85. doi: 10.1227/NEU.0000000000000846. PubMed PMID: 26080069.

4)

Sweet JA, Mitchell LS, Narouze S, Sharan AD, Falowski SM, Schwalb JM, Machado A, Rosenow JM, Petersen EA, Hayek SM, Arle JE, Pilitsis JG. Occipital Nerve Stimulation for the Treatment of Patients With Medically Refractory Occipital Neuralgia: Congress of Neurological Surgeons Systematic Review and Evidence-Based Guideline. Neurosurgery. 2015 Sep;77(3):332-41. doi: 10.1227/NEU.0000000000000872. PubMed PMID: 26125672.