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**Bilateral occipital nerve stimulation for chronic cluster headache**Gaul C<sup>1</sup>, Müller O<sup>2</sup>, Gasser T<sup>2</sup>, Diener H-C<sup>1</sup> and Katsarava Z<sup>1</sup><sup>1</sup>*Department of Neurology, University Essen, Essen, Germany;*<sup>2</sup>*Department of Neurosurgery, University Essen, Essen, Germany*

**Objectives:** Cluster headache is a severely debilitating headache disorder with orbital, supraorbital and temporal localized pain attacks, accompanied by ipsilateral autonomic manifestation. Usually, it appears in bouts (cluster periods) of 6 to 12 weeks followed by periods of remission. Neuromodulatory treatments including deep brain stimulation and occipital nerve stimulation offer a new and promising possibility for treatment of these patients.

**Background:** However, a fraction of cluster patients develop a chronic course. These patients suffer from medication refractory cluster attacks or intolerable side effects of the prophylactic treatment. Neuromodulatory treatments including deep brain stimulation and occipital nerve stimulation offer a new and promising possibility for treatment of these patients.

**Methods:** Five chronic cluster patients underwent bilateral occipital nerve stimulation. Effectiveness of treatment measured by frequency of cluster attacks and use of attack abortive treatment, side effects, and improvement of quality of life (using SF 36) were recorded.

**Results:** On average the patients had three to five cluster attacks a day before treatment. After implantation of the device within four weeks the attack frequency was reduced by 50%. The intake of abortive treatment of attacks (zolmitriptan nasal or subcutaneous sumatriptan) was reduced by more than a half. Three patients even had pain free days, which they did not have over the past years. Moreover, patients showed reinforced effect on oxygen treatment which was not sufficient in the pre-treatment phase. Consecutively, prophylactic treatment could be reduced over time. Pain intensity measured by numeric rating scale (0–10) declined from median 8 to 3.5 under stimulation. All patients reported significant improvement of quality of life. One adverse event appeared with a defect contact of an electrode, what made a surgical revision necessary.

**Conclusions:** In conclusion bilateral occipital nerve stimulation offers a hopeful additional treatment option for chronic cluster headache refractory to medical treatment. In comparison to deep brain stimulation it is a safer and noninvasive method, but more research is needed to establish it in the clinical routine.