



## **15<sup>th</sup> Congress of the International Headache Society 23-26 June 2011, Berlin, Germany**

### **PSI-184**

#### **Combined occipital and supraorbital neurostimulation for chronic migraine headaches: an extended case series**

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**Introduction:** In 1999 we introduced occipital nerve stimulation (ONS) as a novel treatment for occipital neuralgia. Subsequent investigators extended the methodology to migraine headaches with the results suggesting a lower response rate than that for occipital head pain. Hypothesizing that the addition of supraorbital stimulation may improve the results for migraines, we developed the associated procedure and in 2010 reported positive results in a series of 7 patients treated by combined occipital nerve-supraorbital nerve stimulation (ON-SONS). Thereafter, we further perfected the protocol and between 2004 and 2010 implanted the system in 93 patients with chronic migraine headaches.

**Methods:** A retrospective survey was offered to 93 patients who had combined ON-SONS systems implanted. Included were scores for the Short Form-12 (SF-12), Migraine Disability Assessment (MIDAS), headache frequency and severity, med usage, patient satisfaction, and patient preference for either the combined or single modality therapy (ON-SONS vs. ONS).

**Results:** 44 patients responded. All results were significant to  $p < .05$ . The average time since implant was 13 mo. The frequency of severe headaches per month decreased by 81% (19 to 3.6/mo), and 50% of respondents saw virtually complete resolution of headaches (0-1/mo). 73% of patients decreased med usage by over 75%. The SF-12 score improved by 61% and the MIDAS by 84% (170.8 to 26.7). 87% were pleased, and all preferred combined ON-SONS to ONS alone.

**Conclusion:** Combined ON-SONS provides effective therapy for some patients with chronic migraine headaches. The therapeutic response appears to be markedly superior to ONS alone in most patients.