14th Congress of the International Headache Society September 10 – 13, 2009 Philadelphia, PA

PO47

PRISM study: occipital nerve stimulation for treatment-refractory migraine

Lipton RB[1], Goadsby PJ[2], Cady RK[3], Aurora SK[4], Grosberg BM[1], Freitag FG[5], Silberstein SD[6], Whiten DM[7] and Jaax KN[7]
[1]Department of Neurology, Albert Einstein College of Medicine, Bronx, NY, USA; [2]UCSF Headache Center, University of California, San Francisco, San Francisco, CA, USA; [3]Headache Care Center, Clinvest, Springfield, MO, USA; [4]Pain and Headache Center, Swedish Medical Center, Seattle, WA, USA; [5]Outpatient Service, Diamond Headache Clinic, Chicago, IL, USA; [6]Department of Neurology, Thomas Jefferson University, Philadelphia, PA, USA; [7]Neuromodulation, Boston Scientific, Valencia, CA, USA

Objectives: To investigate the safety and efficacy of occipital nerve stimulation (ONS) for the preventive treatment of refractory migraine.
Background: ONS may offer a safe and effective alternative to the currently limited therapeutic options available to migraine sufferers that fail pharmacological management.
Methods: This multi-center, double-blind, randomized controlled trial enrolled participants who (1) met the 2004 International Classification of Headache Disorders (ICHD-2) diagnostic criteria for migraine with aura, migraine without aura, and/or chronic migraine; (2) presented as drug-refractory (failed therapy with at least two acute and two preventive medications); and (3) had ≥ 6 days per month of long-duration (≥ 4 hours) migraine with moderate/severe pain (migraine day). Those overusing acute medications at baseline, per ICHD-2 criteria, were included as a pre-specified analysis subgroup. Prior to implantation, both arms received 5–10 days of percutaneous trial stimulation, using their randomized settings, to evaluate the predictive value of a treatment trial on 12-week outcome. Subjects were randomized 1:1, to receive bilateral active (250 μsec pulses, 60 Hz, 0–12.7 mA) versus sham (10 μsec pulses, 2 Hz, < 1 mA, 1 sec on / 90 min off duty cycle) stimulation for 12-weeks post-implantation of an ONS device. The primary endpoint, captured by daily electronic diary entries, was the change from baseline in migraine days/month evaluated 12 weeks after implantation. At 12 weeks, sham subjects were converted to active settings. Diary follow-up continued for 52 weeks.
Results: Of 179 patients screened for enrollment, 140 eligible subjects were randomized, 132 were implanted and 125 completed 12-week follow-up. For the primary endpoint, reduction in migraine days/month, the difference across treatment arms was not significant (-5.5 vs.-3.9 days/month, $P = 0.29$, Table 1). There was a trend towards a greater difference between treatment arms for those not overusing medication (-5.9 vs.-2.6) in comparison with the medication overuse subgroup (-5.0 vs.-4.8). In the active arm, a favorable response to the percutaneous treatment trial was moderately predictive of 12-week response (positive likelihood ratio = 2.0, 95% CI [1.4 2.9]; negative likelihood ratio = 0.21, CI [0.06 0.78]). Two-year aggregate safety data revealed infection, non-target area sensory symptoms, and implant site pain as the most-frequent device related adverse events.

Table 1.

	n	Baseline days/month (mean ± SD)	Change at 12-weeks (mean ± SD)	*P*-value
Active	63	20.2 ± 7.2	-5.5 ± 8.7	0.29
Sham	62	19.2 ± 7.9	-3.9 ± 8.2	

Conclusions: Active ONS did not produce statistically significant benefits in relation to sham stimulation on the primary endpoint. Heterogeneity in treatment response suggests that there may be a treatment responsive subgroup. Future studies should endeavor to identify and randomize patients likely to respond to stimulation, based in part on the absence of medication overuse and a favorable response to a trial of percutaneous treatment.

PO47

PRISM study: occipital nerve stimulation for treatment-refractory migraine

Lipton RB[1], Goadsby PJ[2], Cady RK[3], Aurora SK[4], Grosberg BM[1], Freitag FG[5], Silberstein SD[6], Whiten DM[7] and Jaax KN[7]
[1]Department of Neurology, Albert Einstein College of Medicine, Bronx, NY, USA; [2]UCSF Headache Center, University of California, San Francisco, San Francisco, CA, USA; [3]Headache Care Center, Clinvest, Springfield, MO, USA; [4]Pain and Headache Center, Swedish Medical Center, Seattle, WA, USA; [5]Outpatient Service, Diamond Headache Clinic, Chicago, IL, USA; [6]Department of Neurology, Thomas Jefferson University, Philadelphia, PA, USA; [7]Neuromodulation, Boston Scientific, Valencia, CA, USA

Objectives: To investigate the safety and efficacy of occipital nerve stimulation (ONS) for the preventive treatment of refractory migraine.
Background: ONS may offer a safe and effective alternative to the currently limited therapeutic options available to migraine sufferers that fail pharmacological management.
Methods: This multi-center, double-blind, randomized controlled trial enrolled participants who (1) met the 2004 International Classification of Headache Disorders (ICHD-2) diagnostic criteria for migraine with aura, migraine without aura, and/or chronic migraine; (2) presented as drug-refractory (failed therapy with at least two acute and two preventive medications); and (3) had ≥ 6 days per month of long-duration (≥ 4 hours) migraine with moderate/severe pain (migraine day). Those overusing acute medications at baseline, per ICHD-2 criteria, were included as a pre-specified analysis subgroup. Prior to implantation, both arms received 5–10 days of percutaneous trial stimulation, using their randomized settings, to evaluate the predictive value of a treatment trial on 12-week outcome. Subjects were randomized 1:1, to receive bilateral active (250 μsec pulses, 60 Hz, 0–12.7 mA) versus sham (10 μsec pulses, 2 Hz, < 1 mA, 1 sec on / 90 min off duty cycle) stimulation for 12-weeks post-implantation of an ONS device. The primary endpoint, captured by daily electronic diary entries, was the change from baseline in migraine days/month evaluated 12 weeks after implantation. At 12 weeks, sham subjects were converted to active settings. Diary follow-up continued for 52 weeks.
Results: Of 179 patients screened for enrollment, 140 eligible subjects were randomized, 132 were implanted and 125 completed 12-week follow-up. For the primary endpoint, reduction in migraine days/month, the difference across treatment arms was not significant (-5.5 vs.-3.9 days/month, $P = 0.29$, Table 1). There was a trend towards a greater difference between treatment arms for those not overusing medication (-5.9 vs.-2.6) in comparison with the medication overuse subgroup (-5.0 vs.-4.8). In the active arm, a favorable response to the percutaneous treatment trial was moderately predictive of 12-week response (positive likelihood ratio = 2.0, 95% CI [1.4 2.9]; negative likelihood ratio = 0.21, CI [0.06 0.78]). Two-year aggregate safety data revealed infection, non-target area sensory symptoms, and implant site pain as the most-frequent device related adverse events.

Table 1.

	n	Baseline days/month (mean ± SD)	Change at 12-weeks (mean ± SD)	*P*-value
Active	63	20.2 ± 7.2	-5.5 ± 8.7	0.29
Sham	62	19.2 ± 7.9	-3.9 ± 8.2	

Conclusions: Active ONS did not produce statistically significant benefits in relation to sham stimulation on the primary endpoint. Heterogeneity in treatment response suggests that there may be a treatment responsive subgroup. Future studies should endeavor to identify and randomize patients likely to respond to stimulation, based in part on the absence of medication overuse and a favorable response to a trial of percutaneous treatment.

