The ESPOUSE Study was a multicenter, current trial, led to FDA approval of sTMS for migraine with aura. An open label study in the Single pulse transcranial magnetic stimulation (tMS) from baseline.

controls, of -0.6 day reduction of headache days estimated placebo effect size, based on historical control group, the PEE was compared to the ending at 12 weeks. In the absence of a placebo per month, and used the device at least once.

completed the baseline headache diary, met the followed by 3 months of treatment. The full treatment of migraine with or without aura.

From December 2014 to March 2016, 263 patients with migraine were consented to complete a 1-month baseline headache diary followed by 3 months of treatment. The full analysis set (FAS) included patients who completed the baseline headache diary, met the inclusion criteria including 5-25 headache days per month, and used the device at least once.

The protocol treatment consisted of both preventive (4 pulses twice daily) and acute treatment (3 pulses at 15 minute intervals repeated up to 3-times for each attack). The primary effectiveness endpoint (PEE), mean reduction of headache days compared to baseline, was measured over the 28-day period ending at 12 weeks. In the absence of a placebo control group, the PEE was compared to the performance goal, which is a statistically-derived, estimated placebo effect size, based on historical controls, of -0.6 day reduction of headache days from baseline.

A total of 263 subjects were consented, 229 subjects were found to be eligible based on the number of headache days, and 217 were assigned a device (safety data set), 132 subjects met the strict inclusion criteria based on the protocol definition of a headache day (4 or more hours of headache reaching moderate to severe pain), comprising the FAS. FAS baseline characteristics include: mean age of 42.8 years; 80.3% female; 85.6% Caucasian, 8.3% African American, 5.3% Hispanic, and 0.8% other.

The PEE analysis was assessed in the FAS dataset. The mean reduction of headache days from baseline compared to the performance goal was statistically significant. There was -2.8 ± 0.4 mean reduction of headache days from baseline (9.1 days) in the FAS compared to the performance goal of -0.6 days (p<0.0001).

19.4% of subjects reported adverse events that were determined as “definitely”, “probably”, or “possibly” device-related. There were no serious adverse events. The top three adverse events were lightheadedness (4.5%), tingling (3.9%), and tinnitus (3.9%). 9 patients withdrew from the study because of adverse events.

The PEE design allowed for a comparison to established placebo rates in migraine prevention, and the FDA accepted this design in approving sTMS in the preventive treatment of migraine.