

## OR15

### **Transcranial Magnetic Stimulation (TMS) relieves migraine headache**

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**Objectives:** To evaluate the feasibility and safety of two TMS pulses, administered during the aura phase, on aborting the migraine headache

**Background:** Up to 25% of the migraineurs experience a visual aura within an hour preceding the headache. The aura is attributed in part to an anterograde cortical spreading depression which may arise in the occiput. We hypothesized that a magnetic pulse(s) is feasible, safe, and may interrupt the cortical depression and the aura and/or headache.

**Methods:** This randomized, double-blind, parallel group, placebo controlled, three-month, feasibility and safety study was conducted in adult migraineurs who experience aura (in at least 75% of migraine episodes with a headache frequency of 1-7 times/month and satisfying International Headache Society criteria) and who used triptans or analgesics on prn basis. Patients were instructed to report to hospital and a TMS device was placed on the occiput. Patients were randomized to either two TMS pulses, or two placebo pulses. Two TMS pulses were given 30 seconds apart. Patients recorded their response over 24-hr period with each migraine episode.

**Results:** There were 42 patients (19 placebo and 23 TMS group) reporting on the treatment experience for 50 headache episodes (21 placebo, 29 TMS). The study sample consisted of primarily females (37, 90%) and average age of 43 yrs (range 19-67). Headache medication use was similar in both groups (17-19%;  $P=0.91$ ). 69% of the TMS-treated headaches reported to have either no or mild pain at the 2-hour post-treatment point compared to 48% of the placebo group ( $P=0.10$ ). 42% of the TMS-treated patients graded their headache response (without symptoms) as very good or excellent compared to 26% for placebo ( $P=0.05$ ). The most significant effect for TMS was on the 2-hour symptom assessment with 84% of the TMS episodes devoid of noise sensitivity compared to 17% of the placebo ( $P=0.0002$ ); 64% of the TMS episodes devoid of light sensitivity compared to 22% of the placebo ( $P=0.0064$ ) and 88% devoid of nausea compared to 56% for placebo ( $P=0.10$ ). Work functioning was improved with 86% of the TMS episodes reported with normal cognition or mild impairment compared to 56% for the placebo ( $P=0.07$ ). There were no side effects reported in either group.

**Conclusions:** TMS pulses were well tolerated in this small, randomized, double blind, "proof of concept" study with statistically significant reductions in light and noise sensitivity and with excellent patient-rated satisfaction marks for headache relief without symptoms. There were strong trends to reduce pain at 2-hours, nausea and to preserve cognition and to improve work functioning. A large randomized trial is underway in order to confirm the findings of this novel modality.