Cranial Electrotherapy Stimulation for the Treatment of Chronically Symptomatic Bipolar Patients

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Objective: The aim of this study was to determine if cranial electrotherapy stimulation (CES) is beneficial in chronically symptomatic bipolar (CSBP) subjects.

Methods: A retrospective chart review of all consecutive CSBP subjects who were prescribed CES collected demographic and clinical information.

Results: The Clinical Global Impression improved significantly [mean (SD), 2.7 (0.6) at baseline vs 2.0 (0.0), t = 0, P < 0.001]; but mood symptoms change minimally. There were very few adverse effects of CES.

Conclusions: Patients with CSBP continue to experience symptoms with CES but also are modestly improved.

Key Words: bipolar disorder, cranial electrical stimulation, chronically symptomatic bipolar patients, depression, mania

21% (both not significant; Table 1). The lack of significant improvement in mood symptoms suggests that the CGI effect may have been driven by improvements in anxiety or other factors, which were not measured in these patients.

These results are in line with previously reported effects of CES. A survey in 2002 showed that 66% of patients with depression had greater than 50% improvement, and 31% of patients reported greater than 75% improvement. More than 35% of patients with anxiety alone (n = 128) reported greater than 75% improvement, but only 29% of patients with both anxiety and depression (n = 58) had greater than 75% improvement. However, survey studies may overestimate the efficacy of treatment modalities, the results are, nonetheless, important to consider.

Even with a small effect size, CES may be a reasonable intervention because it has very few adverse effects (AEs). Adverse effects are uncommon, headache (0.20%) and local skin irritation (0.11%) are the more frequent but are generally mild. Other rare AEs include vertigo, dizziness, disorientation, seizures, nausea, and electrical skin burns at the site of the electrodes. Many of these AEs can be modified by reduction in treatment intensity. In our patients, AEs were very rare and mild.

The mechanism of CES is not known. It is believed that CES may stimulate the vagus nerve, causing a parasympathetic response and resultant relaxation. Much of the effect is believed to be mediated by brain stem nuclei that radiate widely through the central nervous system. This includes all the systems believed to be important in mood and anxiety disorders (dopamine, serotonin, and norepinephrine). Cranial electrotherapy stimulation has been shown to increase synchronous activity on electroencephalogram. This may increase the antidepressant or anxiolytic activity of endogenous systems.

This study has several limitations. First, this was a retrospective naturalistic study without a sham group. Second, the small study sample did not allow for adequate power for the effect size of improvement with CES. Despite these limitations, this study demonstrates that nearly half of CSBP patients feel the improvement in symptoms is worth the financial investment in the device. A larger sample size, a longer intervention period of CES, and the addition of a sham group need to be used in future studies of CES in CSBP.

REFERENCES