

# Cranial Electrotherapy Stimulation for the Management of Depression, Anxiety, Sleep Disturbance, and Pain in Patients with Advanced Cancer: A preliminary study.

\* Study conducted at MD Anderson Cancer Center

## Abstract

### Context

Cranial Electrotherapy Stimulation (CES) is a safe modulation of brain activity for treating depression, anxiety, insomnia, and pain. However, there are no published studies in patients with advanced cancer (ACP).

### Objectives

The aim of the study was to determine the feasibility and preliminary efficacy of a 4-week CES intervention on depression, anxiety, sleep disturbance, and pain scores. Concurrent salivary biomarker studies were conducted.

### Methods

In this one group open label pre- and post-intervention study with a 4-week CES **intervention, ACP's with one or more of four moderate intensity ( $\geq 3/10$ ) ESAS symptoms (depression, anxiety, sleep disturbance, and pain) were eligible.** Adherence (0-100%), satisfaction rates (0-10), and safety were assessed. ESAS, HADS, PSQI, BPI, and salivary levels (cortisol, alpha amylase, CRP, and IL-1 beta and IL-6) were assessed from baseline to week 4.

### Results

33/36(92%) completed the CES. Median (IQR) adherence CES use and satisfaction scores were 93% (89-100) and 10(9-10) respectively and the adherence criteria was met in the study. CES use was safe (no grade 3 or higher adverse events). HADS anxiety ( $p<0.001$ ), HADS depression ( $p=0.024$ ), ESAS anxiety ( $p= 0.001$ ), depression ( $p=0.025$ ), BPI pain ( $p=0.013$ ), PSQI daytime dysfunction ( $p=0.002$ ), and Medication use ( $p=0.006$ ) scores improved after 4 week CES treatment.

### Conclusions

In this preliminary study we found that the use of CES was safe and feasible in ACP. The use of CES was associated with significant improvement of depression, anxiety, pain, and sleep scores. These findings support further studies of CES in ACP for symptom control.

Yennurajalingam S, Kang D-H, Hwu W-J, Padhye NS, Masino C, Dibaj SS, Liu DD, Williams JL, Lu Z, Bruera E. Cranial electrotherapy stimulation for the management of depression, anxiety, sleep disturbance, and pain in patients with advanced cancer: a preliminary study. *Journal of Pain and Symptom Management*. E-published ahead of print, September, 2017.