

Cranial Electrotherapy Stimulation as a Treatment for Anxiety in Chemically Dependent Persons

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Cranial electrotherapy stimulation (CES) is reported to be an effective treatment for anxiety, a major presenting symptom among chemically dependent patients. In this study, 40 inpatient alcohol and/or polydrug users were given CES or sham CES in a double blind design. An additional 20 patients served as normal hospital routine controls. Dependent measures of anxiety were the Profile of Mood States, the Institute for Personality and Ability Testing Anxiety Scale, and the State/Trait Anxiety Index. CES-treated patients showed significantly greater improvement on all anxiety measures than did either control group. There were no differences in response between older and younger patients, or between the primarily drug or alcohol abusers. No placebo effect was found on any of our measures. It is concluded that CES is a clinically significant addition to the treatment regimen for this patient population.

BEGINNING in the 1950s cranial electrotherapy stimulation (CES) has rapidly expanded as a treatment for stress-related pathologies in most of the developed countries of the world.¹ Clinicians in the U. S., however, have been slower to develop an interest in this or other electronic medicine until recently when its use began to burgeon rapidly with everything from biofeedback devices to cardiac pacemakers, bone growth stimulators, and transcutaneous electric nerve stimulators for pain reduction and control. Within this milieu, researchers have begun to take a more serious look at CES as a possible treatment for stress-related disorders.

As of 1985 more than 100 CES studies have appeared in the medical and scientific literature in the United States, at least a dozen of which have been on the use of CES with anxiety patients.² Only one of these studied anxiety in alcoholic patients,³ and only one has studied anxiety in a drug abuse population.⁴ Both studies were single blind, studied a narrow age range of subjects, and did not elucidate potential differences in response to CES among alcohol-, drug-, or alcohol- and drug-dependent patients. Also, they did not show possible differences in responsiveness to CES in younger versus older, long-term addicts or abusers.

In our treatment center of alcohol and/or polydrug abusers, we have replicated and extended Smith's

findings^{5,6} that CES is significantly effective in halting and reversing brain dysfunction in our patients.⁷ We decided to complete a double blind study testing its effects on anxiety among patients whose primary diagnosis was drug addiction. Having found no studies in the literature treating adolescents with CES, we also tested its effectiveness in treating anxiety in younger patients, including our adolescent patients versus older patients who have experienced relatively more prolonged trauma from alcohol and/or drugs. We added a final group to control for any placebo effects since there had been no previous double blind control for this among the anxiety studies in the literature. All subjects receiving CES were given fifteen 30-min treatments.

Method

Subjects

Of the 60 inpatients from our hospital who volunteered for the study, 60% were primarily alcohol abusers, while the other 40% were single or polydrug abusers (average number of drugs abused: 2.17) ranging from prescription drugs to street drugs, including heroin, amphetamines, and cocaine. Their average age was 33.9 yr, average education 12.7 yr, 45% were Caucasian, and 34.9% were female.

Apparatus

The State/Trait Anxiety Index (STAI), the Profile of Mood States (POMS), and the anxiety scale of the Institute for Personality and Ability Testing, Inc. (IPAT) served as criterion variables.

Four Neurotone 101 units were used for the CES treatments. These promised a series of low intensity, sinusoidal electric impulses at 100 pulses/sec on a 20% duty cycle with current variable from 0.0 to 1.0 mA. A double blinding device was connected between the CES device and the patient, with an open position, that passed current directly from the CES unit to the patient, and four treatment settings. Three of the four settings passed current and one did not. The current was applied to the head of the patient through two ear stethoscope electrodes placed just behind the earlobe at the maxillo-occipital juncture.

Procedure

Forty patients were assigned to CES, with 30 expected to receive actual treatment as randomly assigned by the prewired treatment settings in the double blind control boxes. The other 10 would receive sham treatment. Another 20 patients were asked to participate as waiting-in-line patients on the normal treatment program of the hospital with no access to the CES units. All subjects were pre- and post-tested on the IPAT, the STAI, and the POMS.

In the treatment procedure, each patient was connected to a CES unit via the stethoscope electrodes leading from the double blinding box. Initially the dial on the double blinding box was set in the open position and the CES unit turned on. The current was then turned up until the

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patient signaled that he could just feel the current. The current was then turned down until the sensation could no longer be felt, at which time the therapist set the control on the double blinding box to the treatment setting preselected for that patient by random assignment. At that point the current was turned off completely for the one-fourth of the patients who were in the sham treatment condition. The therapist was blind to the treatment or sham treatment condition of any given patient. Fifteen 30-min sessions were given to each subject. The subjects received the session once a day for 3 weeks; patients did not receive sessions on weekends.

RESULTS

On Fisher *t* testing of the means of the subjects, the CES-treated subjects were found to have significantly reduced anxiety levels on every anxiety measure used, compared with their initial level. This is illustrated in Fig. 1.

The sham-treated CES group improved on only two of the six scales of the POMS (tension, vigor), but on none of the other measures. The normal treatment program controls did not post significant gains on any measure. When the two control groups were compared with each other, no differences on any of the measures could be found so they were combined in subsequent analyses and in the figures. These results can be seen in Fig. 2.

Among the patients receiving actual CES treatment, the alcohol abusers and polydrug abusers were broken out separately for analysis. Patients abusing both and whose primary diagnosis was not clear cut were deleted from this comparison. Similarly, the youngest and oldest thirds of the group were compared for any response differences to CES due to age. In spite of the reduced numbers in these last two comparisons, a Fisher *t* test of the means of the

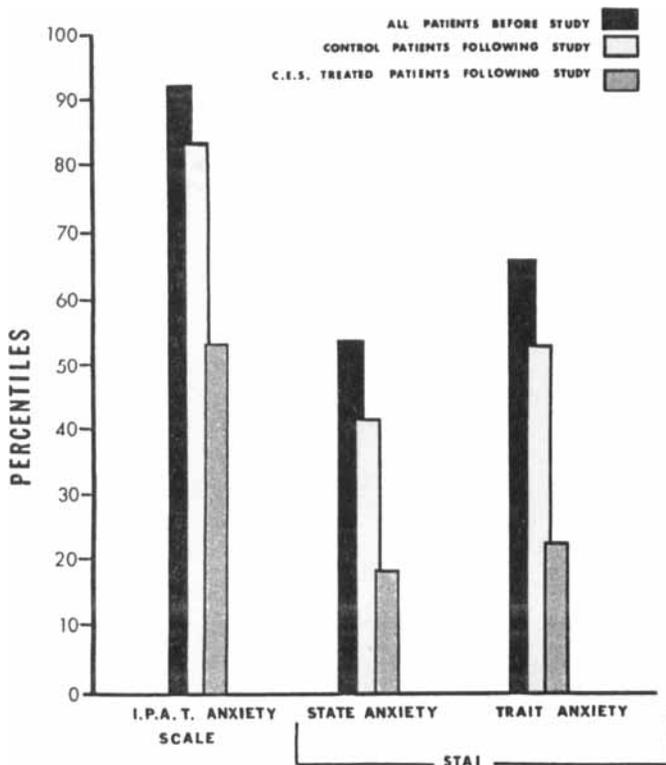


Fig. 1. Patient response on three anxiety scales.

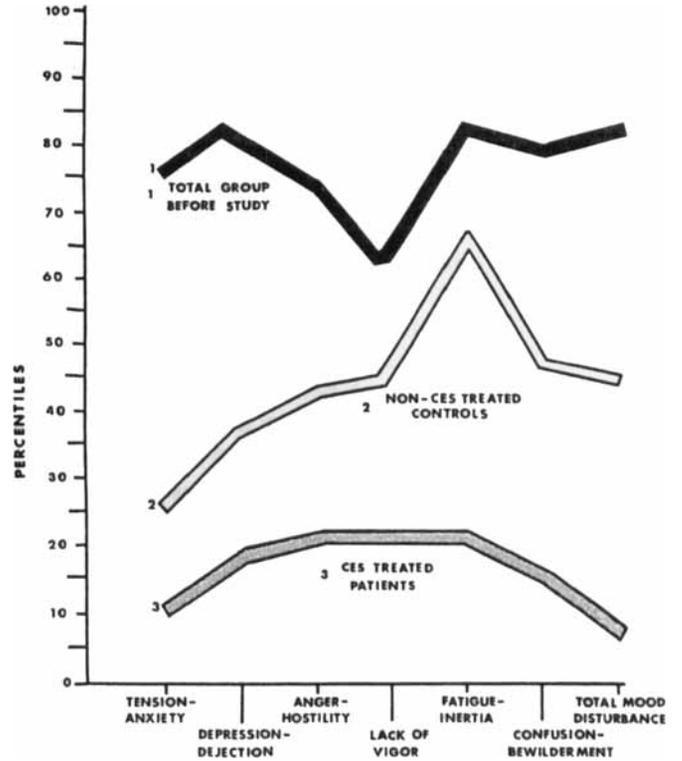


Fig. 2. Patient response on the Profile of Mood States.

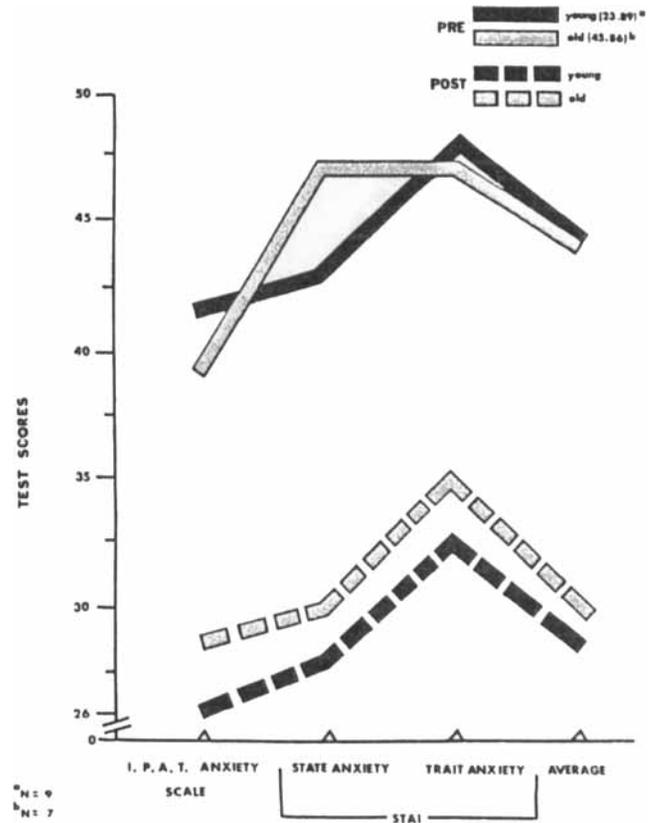


Fig. 3. Age response to CES.

different groups showed that there was no initial difference between the older and younger patients on any of the anxiety measures, and they both responded similarly to CES treatment as shown in Fig. 3. Also, the alcoholic patients and polydrug abusers showed similar levels of

initial anxiety and both groups responded significantly and experienced the same level of improvement with CES as shown in Fig. 4.

DISCUSSION

Currently, there is much discussion among clinicians regarding the similarities and differences in pathology among alcohol and drug abusers, and consequently as to whether treatment approaches to each of them should be similar or different. Since a major emphasis in such programs is the treatment of personal stress which either preceded or is a consequence of such abuse, and in so far as this stress is measured by or reflected in patient anxiety

scores, it now appears that chemical abusers share a major kind of pathology. To the extent that this is true, similarities in treatment approach should prove effective. This study showed this to be true where the use of CES is concerned, in that CES is a significant treatment for both alcohol and drug abuse patients as an adjunct to other treatments currently in our treatment program. Both groups responded to this treatment identically.

While it is often necessary to put adolescent and older patients in separated facilities or program areas within a treatment facility for other reasons, it appears that they can share CES as a treatment modality in that younger patients appear to respond identically with older patients to this treatment.

Placebo effects were not found in this double blind study, nor have they been found in other studies that specifically controlled for this effect.²

CES, then, is rightfully gaining increasing use in American medicine as it gains increasing confirmation as a significant treatment adjunct for stress and cognitive dysfunction in chemical dependency treatment programs, regardless of the chemical of abuse or the age range of the patients treated.

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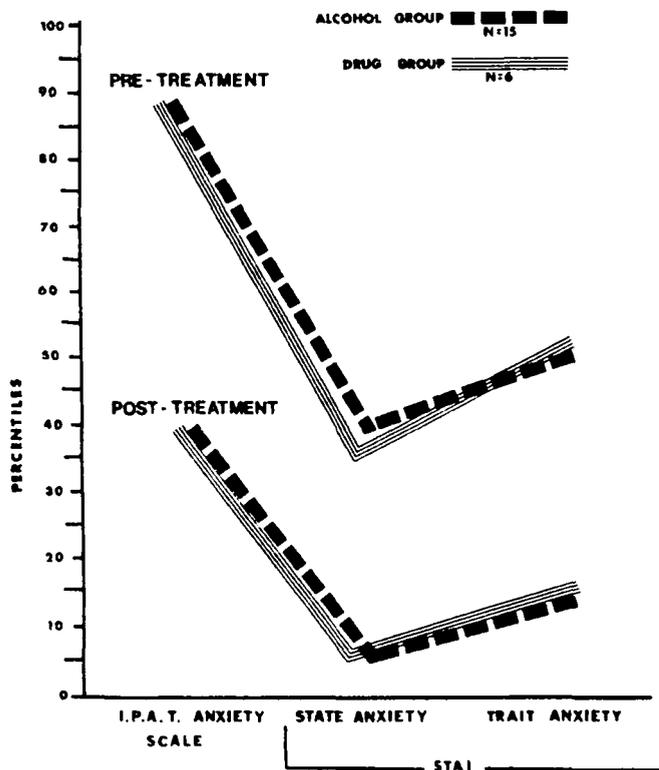


Fig. 4. Alcoholic patients versus drug abuse patients response to CES.