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Review Article

Cranial Electrotherapy Stimulation as A Treatment with Three Violent Jail Inmates and One Violent Tourette's Subject

Ronald R Mellen*[1], Dakota Parker[1] and Aubrey Simmons[1]

[1]*Department of Criminal Justice, Jacksonville State University, USA*

***Corresponding author:** Ronald R Mellen, Department of Criminal Justice, Jacksonville State University, USA.

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Abstract

The present article reviews three previously published single case studies of violent jail inmates and one violent Tourette's subject. The treatment utilized a cranial electrotherapy stimulation device (Alpha-Stim) to reduce violent behaviors and clinical symptoms in the four subjects. The studies were completed between 2009 and 2018. In each of the inmates studied, positive changes in clinical measures and reductions in aggressive behaviors were found. In the Tourette's subject improvements were also noted through self-assessments of clinical issues and tics. Important changes were also noted in improvements in daily life activities.

Keywords: Clinical; Detention; Electrotherapy

Introduction

There are multiple types of aggressive inmates including the predatorial, and those whose violent behaviors are responses to environmental cues. A third group are those suffering with neuro-developmental disorders (NDD) such as individuals experiencing advanced stage Tourette's.

The three inmates in the reviewed studies were recommended by either the County Sheriff or the Director of the Jail/Detention Center. The principal investigator's request, each time, was for the most physically violent inmate in custody. One of the most common descriptors of the recommended inmates was "He is always involved in every fight." The NDD subject was referred by his wife.

Treatment

The treatment variable, the Alpha-Stim SCS, was the same for each of the inmate/subjects. It is a handheld device that uses a 9 V battery to produce a proprietary electric current. The device uses clips that attach to the earlobes. It is simple to use, yet frequently produces significant positive changes in the behaviors of inmates. It accomplishes this by encouraging the brain to produce higher levels of the neurotransmitter serotonin. The increased serotonin leads to a calming on the inmate's brain functioning and reduces the frequency of their engaging in violent behavior. The treatment also reduces cholinergic activity in the thalamo-cortical circuit (anxiety & stress). Increasing serotonin levels and, at the same time, reducing cholinergic activity in the inmate's brain produces a brain-modulation effect which also increases positive decision-making. There are over 100 published studies Kirsh [1] that successfully used the Alpha-Stim as its treatment for psychological dysfunctions & pain management.

Methodology

The four single case studies all followed the same basic research design. Each study used the Alpha-Stim as the treatment

variable. The dependent variables were administered pre- and post-treatments to assess possible effects of the Alpha-Stim. The dependent variables measured changes in personality traits, clinical symptoms, and executive functioning. Self-Assessments & assessments-by-others were sometimes completed. In one study qEEG readings were taken pre-and post-treatment. INMATE RR [2] RR's demographics are presented below in greater detail than the other inmates since all were found to have personal histories reflecting significant difficult family & early life experiences. The Tourette's subject had a positive personal history.

The subject, RR, was a 19-year-old Caucasian of average height and weight with no physical or apparent cognitive disabilities. He reported never having been married but that he had a 14-month-old daughter who lived overseas. The subject's family was composed of biological parents, two stepparents, two sisters and two stepsisters. His ordinal position was third. During his childhood he lived with his mother and step-father. He described his mother as an intermittent recovering alcoholic and his stepfather as a chronic marijuana abuser. His biological father had a history of methamphetamine abuse and had at least one criminal conviction. The inmate reported an extensive history of fistfights with his biological father. RR described his childhood as unhappy, painful, hard to remember, and that he, himself, was active, aggressive, irresponsible, rebellious, and stubborn. He had problems getting along with others and experienced frequent nightmares. He also reported an intense fear of failure and a fear of falling that began in childhood.

When he was 13 years old, while living in Chicago, Illinois, he was brutally initiated into a gang. He was sentenced to boot camp for gang activity but was kicked out of the camp for fighting and he eventually went AWOL. He fought on the streets especially where drugs were involved. His nose has been broken twice and he stated that he has had "more black-eyes than he can count". A history of head trauma can be important in understanding the behaviors of many violent inmates. Subject RR reported two serious instances of head trauma. The first was at the age of four years when the horse kicked him in the head. The injury required 48 stitches to the left eyebrow area. The injured area was near the orbitofrontal cortex, which is involved with controlling emotions. The second injury to the head also required many stitches. This injury occurred when he was 17 years old and a passenger in a serious car wreck.

While his drug history included marijuana, cocaine, pills, opiates, and barbiturates, he began using crack cocaine and methamphetamines at the age of 17 years. Most recently he was using meth intravenously. At the time this research was carried out inmate RR had been court ordered to complete the detention center's Substance Abuse Treatment Program. If he failed to complete the program, he was court-ordered to be sent immediately to the state prison system. If he successfully completed the program, he would be sent home.

The Director of the Detention Center related RR's experiences in the treatment program prior to starting the Alpha-Stim treatment. He noted that in this program inmates resided in pods with a population of 8 to10 inmates. During the first week RR was involved in a physical altercation. As a result, he was assigned to Administrative Segregation (Ad Seg) for 40 days in order "to think things over." Upon release he was involved in a second fight and received 40 additional days in Ad Seg. He was again released from Ad Seg at which time he attacked a jail security officer and threatened the officer's wife. The director liked the young inmate, but the sequence of events had exhausted his patience with RR. The director told the inmate that this would be his last Ad Seg. If he engaged in any aggressive behavior, he would be sent immediately to state prison. The inmate stated he did not care if he went to prison, and the prognosis was extremely poor indeed. Inmate RR volunteered for the Alpha-Stim treatment which began immediately upon his being was released from Ad Seg.

Treatment Program

The inmate completed 15 treatments with the Alpha-Stim each lasting 40 minutes. All treatments were completed within a 45-day treatment period. The daily treatment amperage, which was chosen by the inmate based on comfort with the device, ranged between 300 and 400 uA. The dependent variables included the 16 Personality Factors Inventory and personal self-assessments by the inmate as well as behavioral assessments by the Substance Abuse Program leader.

Results

Post treatment results from the 16 Personality Factors Inventory indicated support for the following changes: increases in warmth, emotional stability, spontaneity, social boldness, openness to change, affiliativeness, and self-discipline. Decreases were observed in threat sensitivity, tension, and apprehensiveness.

A weekly assessment of the inmate was completed by the substance abuse program leader who noted that prior to the third treatment session the inmate stated he felt "more natural", rather than feeling agitated. He was found to share his thoughts with other members in his pod. On the fourth day of treatment, he reported increase ability to concentrate while on the fifth day he reported he felt less negative toward other people. In summary the inmate was found to show improvement in his ability to address issues with Pod family members.

On the eighth day of treatment the subject volunteered to be a part of a new inmate suicide watch. The program staff saw a sufficient number of positive changes in the subject that the Director of the Detention Center promoted RR to pod leader. RR's self-assessment provided measures on the following issues: anger, anger control, calmness, anxiety, coping skills, and patience. The range was from a score of one which indicated serious trouble with the issue being addressed to a score of 10 which indicated no trouble with that issue. His beginning daily mean was 3.6 and his average at the completion of treatment was 7.1 INMATE DH [3].

The subject was a 31-year-old male Caucasian with a long history of drug use, as well as aggressive and violent behavior. His current charge was attempted capital murder of a deputy sheriff. His father died of a heroin overdose at the age of 36 years and his mother died in a motorcycle accident. The inmate stated his jail incarcerations were too numerous to count.

Methodology

The treatment variable was the Alpha-Stim. The dependent variables were the BRIEF-A (executive functioning), the Brief Symptom Inventory (clinical symptoms), the 16 PF (personality factors), and the Mini-Q EEG (a measure of electrical activity in the brain). Inmate DH received 12 treatment sessions with the Alpha-Stim over 20 days. Each session lasted 45 minutes. The Mini-Q EEG along with the other dependent measures were administered in the traditional pre-post treatment paradigm.

Findings

The calming effects of the Alpha-Stim treatment were apparent in the qEEG readings. As expected, there was a positive global modulation effect is demonstrated by the following bandwidths readings: Delta dropped 40%, Theta was reduced by 25%, Alpha was reduced by 17% and beta dropped 12%. The BRIEF-A results showed reductions from the clinical range to normal functioning in four domains related to executive functioning: ability to self-inhibit, increased cognitive flexibility, ability to control emotions and ability to self monitor. DH's scores on the16PF show positive changes with reductions in tension, vigilance and his need for privateness. His results also indicated a willingness to trust others. His scores included an increase in liveliness, emotional stability, and social boldness. The inmate's Brief Symptom Inventory's nine clinical measures were initially all in the extreme negative range (64-80). Under normal circumstances two scores in the clinical range would call for a full psychological assessment. DH's scores suggested serious emotional and cortical difficulties.

However the post-treatment results showed eight of his clinical scores were now within the normal range: insomnia went from 78 down to 50; obsessive-compulsive 74 to 50; depression 80 to 50; anxiety 80 to 54; hostility 80 to 52; phobia 74 to 50; paranoia 76 to 63; psychesthenia 80 to 58.DH's post-treatment debriefing remarks included" my legs don't bounce up and down all the time like they used to", "I'm less agitated," "even though my brain used to be more active, I now get more things accomplished."

Five years after completing the Alpha-Stim treatment the principal investigator received the following missive from inmate DH. This was a spontaneous communication from the inmate and had not been solicited by the Principal Investigator.

Dr. Mellen. Don't know if you'll remember me but I participated in a research study between 2006-11. I have the exact date if you need. It was at the AA County Detention Center while I was in the substance abuse prevention program. Dr. BB offered me that opportunity and many more.

The reason I wanted to email you was for you to see the aftereffects. When I look back it seems surreal. Here is a link to an article that portrays me then. And now things are drastically different. I can be found 5 years almost to the day later in a positive light from the same newspaper. Since my release I have sole legal and physical custody of my 9 year old daughter, have a daughter turning 1 in May, married to a wonderful woman who has started an organization to help people suffering, I am the compliance officer at a court ordered non profit, I work full time as an optician at a practice where all my talents and abilities are utilized (I am able to manage the optical department, develop the web presence, administer the network, service the high tech optical equipment, plus much more. As well I am the resident maintenance technician at a very nice apartment complex. And in my spare time I like to Garden

My wife is holding a 4.0 at University of North Alabama with a major in psychology and minor in criminal justice. So, she is obviously interested in what happened. But to tell you the truth I don't even know. All I know is that sometimes I look back and it is amazing. You can find me on facebook, linkedin, and google plus. Additionally, my contact information should be at the bottom of the page. Thank you for your time Inmate DT [4]. The volunteer subject was a 22-year-old Caucasian male who has never married. He had a serious drug problem and frequently engaged in violent behavior which had contributed to his frequent encounters with law enforcement. He also stated he has lost count of how many times he had been in jail. However, he was proud of the fact that he only been to prison once. When asked about his important life goals he stated he wanted to have a family, get his GED and the college education. The things he wanted to change the most were his habits which included smoking, drug and alcohol abuse but most of all he wanted to stay out of jail. The present subject was chosen because of an extensive history of aggressive and violent behavior which continued while retained in the county jail. It was noted the by the jail security staff that he was a participant in every fight that occurred in the jail.

Independent variable: the independent variable was the same in this study as in the above reviewed studies: The Alpha-Stim.

The dependent variables were:

*Brief Symptom Inventory: A measure of nine clinical symptoms and three general levels of stress.

*BRIEF-A: A measure of frontal lobe executive functioning.

*Trauma Symptom Checklist

* Emotion Identification Scale

*Inmate self-assessment, daily

Treatment Application

The final decision on the micro-amp range was chosen by the inmate and based on the subject's comfort level. The treatment

was administered by two students, one a college undergraduate and the other an ABD psychology/neurology student. The student assistants were supervised by the Principal Investigator. The treatment sessions were applied in an observation room at the jail. The safety of the inmate and research staff was provided by jail security staff. The inmate received 10 Alpha-Stim treatments which lasted 40 minutes each. The inmate was cooperative during pre-post assessment sessions and the treatment sessions.

Results

posttreatment changes in the dependent variables were examined for main effects. DT's results showed positive changes in four of the BSI's Clinical Scales: Reduced Somatization (bodily complaints), Obsessive-Compulsive thinking, reduced Depression and Hostility. His results also showed improved Interpersonal-Sensitivity,

On his BRIEF-A the inmate showed significant improvement in his ability to inhibit his behaviors, his ability to shift his thinking (flexibility in thinking), and working memory, His Emotion Identification Scale was seven out of 10. Most individuals score 10 out of 10 while inmates tend to score between five and seven.

DT's scores on the Trauma Symptom Checklist fell within the normal range and on the suicide assessment he showed no evidence of suicidal thoughts. The jail security officers overall assessment of the inmate stated he was a person who had experienced positive changes and no longer created trouble in the jail. There was one behavioral anecdote. The day before the inmate was to be released a fight broke out and instead of joining in the altercation, his usual behavior, the subject stopped the fight by stepping between the three inmates in the fight and said, "Come on fellows and don't hurt this old man". The jail security staffs, and fellow inmates were shocked by this change his behavior.

Such improvements in psychological functioning and general cooperation, when combined with the anecdotal evidence of stopping fights rather than engaging in them strongly suggests that this device can sometimes make the daily job experience for jail security officers and inmates safer.

A Violent Tourette's Subject

The subject was a 21-year-old Caucasian male. His Tourette's symptoms began in childhood and in the seventh grade he had to shift to home schooling due to harassment from students and some staff. He did graduate with his GED [5]. Prior to beginning the Alpha-Stim treatment his symptoms had proven refractory to psychological, pharmacological and behavior treatments. He had difficulty going out in public, such as to the grocery store, and applying for jobs. His job history was one of strictly menial work.

Experimental Design

The subject was allowed to choose the uA level and frequency of application during the programmed 10-day treatment period. He completed eight 20-minute sessions the first day of treatment and set the uA current level at 300uA, however he quickly moved to the top level of 500uA which he used for all remaining treatments. The subject, with the Principal Investigator's permission, continued for an additional 10 days of treatment (days 11-20).

His daily Self-Assessment Scale ratings addressed the following: Tics, General Anxiety, Social Anxiety, Depression, Insomnia, Pain, Anger, Nicotine Dependence & Alcohol Dependence. The lower the scores the greater the pain and discomfort for the subject. Conversely higher scores indicated reductions in pain and discomfort with the scores ranging from 0 to 10. A rating of 10 meant the subject was symptom-free. The subject did not have access to his earlier assessments as he filled out his current daily self-assessment form.

Self-Assessment

The following are the subject's mean scores on assessed symptoms. These ratings are for Pretreatment Day and days 10 and 20. Anecdotal notes: The subject's wife reported that he continues to use the Alpha-Stim device once a day, twice a week. She also provided quotes from the client that he repeated frequently as treatments progressed. These included "I don't hate anything anymore. except Communists", "I feel like a completely new me", "Life changing." Finally, she reported that after four months of treatment he was employed as an aircraft serviceman and that he has plans to become an A&P mechanic.

Summary

While the above summaries are from single case studies treatments using a cranial electrotherapy stimulation device (Alpha-Stim) produced significant change in the emotions and behaviors in the three inmates and one violent NDD subject.

Acknowledgement

None.

Conflicts of Interest

No Conflicts of Interest.

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