

Cranial Electrotherapy Stimulation (CES)



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By affecting the electrical activity of the brain, cranial electrotherapy stimulation may be a safe alternative to drug treatment for conditions ranging from depression, insomnia and drug addiction to headaches and even AD/HD.

The application of electric current is certainly not new to the healing arts. The ancient Egyptians knew the therapeutic value of naturally occurring electrostimulation, and wall reliefs in Egyptian tombs show the healing use of the Nile catfish, which emits an electric shock when touched. Both Aristotle and Plato referred to the black torpedo (an electric ray fish), which the Roman physician Scribonius Largus later prescribed for relieving headaches and gout in 46 AD (his patients had to stand on a live fish).

The earliest account of the use of small amounts of low-voltage current for therapy appeared in the 1950s in the Soviet Union and only came to the attention of the West after an international symposium on electrotherapeutic sleep in Austria in 1966.¹

APPLICATION

Cranial electrotherapy stimulation (CES) is non-invasive. It involves passing very small electrical impulses (microcurrents – usually 1 milliamp (mA), and up to a maximum of 1.5 mA) across the base of the skull, most often by placing electrodes or clips on or near both ears.

USES OF CRANIAL ELECTROTHERAPY STIMULATION

The US Food and Drug Administration (FDA) has recognised CES as a safe treatment for anxiety, depression and insomnia. It is also used to treat other conditions such as stress, headache, cognitive dysfunction in head-injured patients, fibromyalgia and pain² and has been proven to be effective with virtually no adverse effects.³ CES must *not* be confused with the electroshock therapy used by psychiatrists to treat severely depressed patients.

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An important aspect of CES is its potential as a substitute for drug therapy in the above conditions, where drugs may have undesirable side-effects and can even be addictive. It can also be used in the treatment of a variety of chronic conditions, including reflex sympathetic dystrophy

and an increase in the brain's levels of serotonin and beta-endorphin,^{5,6} GABA and DHEA and a lowering in the levels of cortisol and tryptophan.⁷

A meta-analysis of randomised controlled trials conducted by the Harvard School

‘CES must *not* be confused with the electroshock therapy used by psychiatrists to treat severely depressed patients’

of Medicine and multiple sclerosis, and as part of the supportive treatment of alcoholism and drug addiction.

STUDIES

Numerous studies have shown the beneficial effects of CES.⁴ The electrical current causes

of Public Health, comparing CES with sham treatment, confirmed CES to be significantly more effective than placebo in relieving anxiety, headache and pain under anaesthesia.⁸ Another study showed that CES produced a significant improvement in attention and concentration while performing

a psychomotor task.⁹ This suggests that it could be valuable in providing non-drug assistance to learning-disabled children, such as those with attention deficit/hyperactivity disorder (AD/HD).

MODE OF ACTION

CES appears to affect particular groups of nerve cells located in the brainstem that produce the chemicals serotonin and acetylcholine.⁴ These substances influence the chemical activity of nerve cells both nearby and at distant sites in the nervous system. (The cells in the brainstem actually control the activity of the nerve pathways that run up into the brain and down into the spinal cord.)

CES stimulates activity in some neurological systems and damps down activity in others by changing the electrical and chemical activity of nerve cells in the brainstem. This neurological fine-tuning (or re-tuning) produces alpha rhythms,⁴ a particular type of electrical activity pattern in the brain that is accompanied by feelings of calmness, relaxation and increased mental focus, thereby reducing agitation and the effects of stress, stabilising mood, and helping to control sensation and perception of certain types of pain.

ADVERSE EFFECTS

Adverse effects of CES, which occur only occasionally and include dizziness, skin irritation and headaches, are usually mild and resolve naturally. Treatment immediately before going to sleep may lead to difficulty in sleeping because of increased alertness, so it is recommended that CES should be used at least three hours before bedtime. Paradoxical reactions (the opposite to the intended effect), such as hyper-excited states, increased anxiety and sleep disturbances, are extremely rare. Pregnancy is not considered to be a contraindication to use of CES, but safety in pregnancy has not been established.

Of 17 follow-up studies continued up to 2 years after treatment, none showed CES to have negative effects.³

CONCLUSION

CES is a safe and relatively inexpensive non-drug method for treating anxiety and depression and is very helpful for insomnia and painful conditions such as tension headaches, migraines and fibromyalgia. It can also be beneficial in managing abuse of substances such as drugs and alcohol and could potentially help in the management of AD/HD. 🌱

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