

TRANSCRANIAL DIRECT CURRENT STIMULATION: A NOVEL NEUROMODULATION TECHNIQUE ?

Transcranial direct current stimulation (tDCS) is a minimally invasive form of brain stimulation that uses direct electrical current to alter cortical excitability. During this process, a weak, direct electrical current (1 to 2 mA) is applied using scalp surface electrodes. Anodal stimulation increases cortical excitability and cathodal stimulation decreases it. The changes in cortical excitability probably arise from the depolarization and hyperpolarization of neurons.¹ Interest in this treatment modality had begun way back in the 1960s but gradually waned. Renewed interest began emerging in the 1990s following spurt in neuromodulation research using transcranial magnetic stimulation (TMS). Based on the theory of hypoactivity in left prefrontal cortex in depression, anodal tDCS has been applied to the left hemisphere to increase activity and cathodal tDCS to the right hemisphere to decrease activity in order to resolve depression. Several open label and randomized controlled trials have been conducted to examine the efficacy of tDCS in treating major depression some of which have yielded positive results.^{2, 3, 4} tDCS has also been tried in Parkinson's disease, schizophrenia, post traumatic stress disorder and substance use.^{5, 6, 7} tDCS is a cheap and non-invasive technique with minimal side effects like headache and itchiness and redness at the site of stimulation. It will require few years of systematic research to find out whether tDCS emerges as a cheap, non-invasive and above all, effective method for treatment of psychiatric disorders or it goes into oblivion as another "fancy" brain gadget!

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