

Transcranial direct current stimulation improves sleep in patients with post-polio syndrome

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Of the 15 million people around the world who have survived poliomyelitis, up to 80% report progressive deteriorating strength and endurance many years after infection, a condition known as post-polio syndrome (PPS). Researchers in Italy from the National Hospital for Poliomyelitis, the Policlinico G.B. De Rossi in Verona, and the University of Milan have found that transcranial direct current stimulation (tDCS) for 15 days improved sleep and fatigue symptoms in patients with PPS, suggesting this non-invasive tool may be a new therapeutic option for this condition. Their results are published in *Restorative Neurology and Neuroscience*.

Post-polio syndrome (PPS) is a neurological disorder that may first appear years after an acute polio infection. In addition to worsening weakness and fatigue, pain, depression, cold intolerance, and [sleep disturbances](#) also may occur. Although polio vaccines have drastically decreased the incidence of new cases of polio in industrialized countries, new cases still occur in areas of Asia and Africa. As polio survivors age, PPS symptoms emerge, even in people who have been stable for 15 years or more. The cause of PPS still remains elusive, and there are no definitive treatment options.

The study enrolled 32 patients who had contracted polio at a mean age of 31 months, but then were stable clinically for an average of 55 years. They were referred to a national reference center, the Physical

Rehabilitation Medicine Unit at Malcesine Hospital in Verona, Italy, for the treatment of PPS after complaining of progressively worsening weakness and fatigue. Half of the patients were randomly assigned to receive anodal tDCS applied bilaterally to the [premotor cortex](#) every day, 5 days a week, for three weeks. The control group received current for 5 seconds (sham tDCS). In preliminary testing, subjects said they could not distinguish between real and sham tDCS.

Patients underwent a battery of tests at baseline and then three weeks later. The tests looked at quality of life, multiple aspects of fatigue, depression, and sleep quality.

The authors found that tDCS treated patients improved more than sham-treated patients on several measures of a patient health survey (the Short Form Health Survey or SF-36), including physical functioning, role limitations due to physical health, vitality, social functioning and role limitations due to emotional health. No significant differences were found between the groups on questions related to bodily pain, general health, or mental health.

One of the most noticeable effects of tDCS treatment was an improvement in sleep quality. Scores on the Pittsburgh Sleep Quality Index (PSQI) decreased 65% compared to 25% in the control group, a significant difference (p

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