

## The Effect of Bihemispheric Transcranial Direct Current Stimulation Therapy on Upper Extremity Motor Functions in Stroke Patients

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**Abstract :** New approaches and treatment modalities are being developed to make patients more functional and independent in stroke rehabilitation. One of these approaches is transcranial direct stimulation therapy (tDCS), which aims to improve the hemiplegic upper limb function of stroke patients. tDCS therapy is not in the routine rehabilitation program; however, the studies about tDCS therapy on stroke rehabilitation was increased in recent years. Evaluate the effect of tDCS treatment on upper extremity motor function in patients with subacute stroke was aimed in our study. 32 stroke patients (16 tDCS group, 16 sham groups) who were hospitalized for rehabilitation in Başkent University Physical Medicine and Rehabilitation Clinic between 01.08.2016-20.01-2018 were included in the study. The conventional upper limb rehabilitation program was used for both tDCS and control group patients for 3 weeks, 5 days a week, for 60-120 minutes a day. In addition to the conventional stroke rehabilitation program in the tDCS group, bihemispheric tDCS was administered for 30 minutes daily. Patients were evaluated before treatment and after 1 week of treatment. Functional independence measure self-care score (FIM), Brunnstrom Recovery Stage (BRS), and Fugl-Meyer (FM) upper extremity motor function scale were used. There was no difference in demographic characteristics between the groups. There were no significant differences between BRS and FM scores in two groups, but there was a significant difference FIM score ( $p=0.05$ ). FIM, BRS, and FM scores are significantly in the tDCS group, when before therapy and after 1 week of therapy, however, no difference is found in the sham group ( $p < 0,001$ ). When FBS and FM scores were compared, there were statistical significant differences in tDCS group ( $p < 0,001$ ). In conclusion, this randomized double-blind study showed that bihemispheric tDCS treatment was found to be superior to upper extremity motor and functional enhancement in addition to conventional rehabilitation methods in subacute stroke patients. In order for tDCS therapy to be used routinely in stroke rehabilitation, there is a need for more comprehensive, long-termed, randomized controlled clinical trials in order to find answers to many questions, such as the duration and intensity of treatment.

**Keywords :** cortical stimulation, motor function, rehabilitation, stroke

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