Effect of Self-administered Transcranial Direct Stimulation in Patients with Major Depressive Disorder: A Randomized, Single-blinded Clinical Trial

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Objective: In numerous studies that have addressed transcranial direct current stimulation (tDCS) devices, participants visit the hospital regularly and undergo stimulation directed by health professionals. This method has the advantage of being able to deliver accurate stimuli in a controlled environment, but it does not adopt the merits of tDCS portability and applicability. Thus, it may be necessary to investigate how self-administered tDCS treatment at home affects depression-related symptoms.
Methods: In this randomized, single-blinded clinical trial, 58 patients with major depressive disorder were assigned to active and sham tDCS stimulation groups, and treatment responses were evaluated biweekly over six weeks. Both active and sham tDCS treatment group were treated with escitalopram. All participants were instructed the protocol and usage of at-home tDCS device, and self-administered tDCS treatment at their home.
Results: The beck-depression inventory score decreased significantly as treatment progressed, and the degree of symptom improvement was significantly higher in the active group than in the sham tDCS group. There were no significant differences between the two groups in other indices, including the Hamilton Depression Scale.
Conclusion: These results suggest that patient-administered tDCS treatment might be effective in improving subjective symptoms of depression.

KEY WORDS: Transcranial direct current stimulation; Depression; Therapuetics; Home-settings.

INTRODUCTION

Major depressive disorder (MDD) is a severe psychiatric illness that causes various psychological and cognitive symptoms that eventually lead to deterioration of daily functions [1]. Patients with MDD share similar psychiatric symptoms, but their progress and responses to treatment are highly variable, complicating therapeutic management of depression [2].

Cross-country evidence suggests that the prevalence of depression is consistent with sociodemographic correlates [3]. In South Korea, the lifetime prevalence of major

depressive disorder was 5.0% (3.0% in males and 6.9% in females) among the entire population, and the annual prevalence rate was 1.5% (1.1% in males and 2.0% in females) in 2016 [4]. However, the number of patients who actually visit the hospital and receive treatment is much smaller than that of patients suffer from MDD [5].

Although various treatment methods have been introduced including antidepressants, psychotherapy, electroconvulsive therapy, and the combination of these therapeutics [6], due to the heterogenicity of the illness, the response to treatment is widely inconsistent [2]. About two-thirds of patients in a previous study diagnosed with MDD were receiving related treatments, and only one-third of patients were taking antidepressant medications, which is the first-line therapy option for managing MDD [7]. This relatively low rate of antidepressant usage is also correlated with patient reluctance to initiate medication due to worries of side effects and drug addiction [8] and only 25 to 50 percent of depressive patients adhere to the anti-