Right-sided Transcranial Direct Current Stimulation and Attentional Salience of Auditory Hallucinations in Schizophrenia

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ABSTRACT

Transcranial direct current stimulation (tDCS) is a safe, noninvasive technique demonstrated to reduce persistent auditory hallucinations in patients with schizophrenia. Here, we report the differential effect of tDCS on auditory hallucinations against other positive symptoms and also the use of right-sided tDCS in patients with increased attentional salience toward auditory hallucinations.

Key words: Auditory hallucinations, positive symptoms, salience, transcranial direct current stimulation

INTRODUCTION

Transcranial direct current stimulation (tDCS) is a safe, reemergent, noninvasive brain stimulation technique demonstrated to reduce persistent auditory verbal hallucinations (AVHs). tDCS is also used to facilitate improvement in cognitive deficits and negative symptoms domain. There is a paucity of literature on the effect of tDCS on other positive symptoms such as delusions, thought alienation, and formal thought disorder. In addition, there is a recent report on clinical utility of attentional salience of AVHs to influence the laterality specific response to tDCS.

CASE REPORT

Mrs. K is a 28-year-old married female, diagnosed with schizophrenia (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition) for 12 years characterized by thought alienation, 2nd and 3rd person auditory hallucinations, olfactory hallucinations, bizarre delusions, and formal thought disorder. She was admitted with exacerbation of above symptoms over the past 3 months despite being regular on treatment with 6-mg/day of risperidone. In the past, she had been treated with olanzapine (30-mg for 8 months).

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and flupenthixol (40-mg fortnightly for 6 months) with poor response. Her baseline psychopathology ratings were as follows: Brief Psychiatric Rating Scale version 4.0 (BPRS) score was 54. Auditory hallucinations score was 39 on Psychotic Symptom Rating Scale - hallucinations dimension (PSYRATS).[9] She had marked salience toward her hallucinations, paying full attention to voices altering her thought, speech and behavior with a score of 7 in the attention salience component of Auditory Hallucinations Rating Scale (AHRS).[7] In view of significant attention salience toward hallucinations, it was decided to stimulate right dorsolateral prefrontal cortex activity with anode and inhibit right temporoparietal junction with cathode through add-on tDCS along with continuation of stable antipsychotic dosage.

She reported a significant reduction in auditory hallucinations following tDCS. In her own words “I heard them speaking about me throughout the day but now I hear occasionally around 5 min once in every 2–3 h. They are not disturbing me anymore. I am able to concentrate on work at hand.” PSYRATS hallucination score reduced to 27 from 39 (more than 30% reduction). AHRS salience score (item 6) reduced to 2 (distracting occasionally) from 7. However, BPRS score showed minimal change (54–53).

**DISCUSSION**

In this case, we attempted to evaluate the possible effects of tDCS on various symptoms of schizophrenia other than auditory hallucinations such as delusions, thought alienation, and formal thought disorder. As demonstrated before,[1,2] there was a clinically significant reduction of auditory hallucinations but not in other symptom domains. This points to the differential effect of tDCS on AVHs against other positive symptoms. In addition, we successfully used right-sided stimulation instead of the usual left[1,2] based on literature on functional imaging, magnetic, and DCS.[3,9,10] This adds to the existing observation of clinical utility of “attentional salience” in individualizing neuromodulation.

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**Conflicts of interest**

There are no conflicts of interest.

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