NEUROSTIMULATION TECHNIQUES INCLUDING RTMS, TDCS, AND TACS FOR TREATING AUDITORY HALLUCINATION IN SCHIZOPHRENIA: A SYSTEMATIC REVIEW

Objectives:
Some 25-30% of patients with schizophrenia are refractory to medication treatment. Recently, neurostimulation has emerged as an alternative biological treatment for these patients. In this systematic review, we summarize the evidence of treating auditory hallucinations in adults with schizophrenia with three specific neurostimulation modalities.

Methods:
We searched PsycINFO from inception to March 2020 for randomized controlled trials that used rTMS (repetitive transcranial magnetic stimulation), tDCS (transcranial direct current stimulation), or tACS (transcranial alternating current stimulation) to treat auditory hallucinations.

Results:
A total of 128 records were identified, of which 8 met the inclusion criteria, comprising 5 rTMS studies, 3 tDCS studies, and no tACS studies. Regarding rTMS, two of the smaller trials demonstrated significant effect on reducing hallucinations as measured by the AHRS (Auditory Hallucination Rating Scale), but three larger trials found a negative result. Two of the tDCS papers investigating tDCS to treat hallucinations found robust effect sizes of 1.58 and 1.98, but only had sample sizes of 25-30 and short follow-up periods, whereas a larger trial had a negative result.

Conclusions:
rTMS showed initial promise for treating hallucinations, but recent large-scale studies indicate no difference with sham. tDCS has only a few small studies, and larger sample sizes are needed to more reliably draw conclusions on its effect for reducing hallucinations. tACS has the least evidence; in fact, no studies met criteria for this review. Before undertaking more experiments, it would be important to research the underlying brain network to determine the optimal brain structures to stimulate.