We present the socio-demographic, big Five personality traits and clinical comorbidity profiles of our entire population along with individual Talairach coordinates and MRI results.

During an exploratory phase with the twenty first patients, we found a 94% improvement on cognitive flexibility score: we implement a more detailed neuropsychological testing for the 40 next ones, including Corsi test, facial emotions recognition task (TREF), switch task, N back task, sustain attention to response task (SART) and Trail Making Test A and B.

Conclusion: such a protocol is feasible and safe in a clinical routine setting. Cognitive improvement was more systematically present than symptoms reduction in a highly comorbid treatment-resistant cohort, especially for facial emotion recognition.

References:

1. *Cole EJ et al: Stanford Neuromodulation Therapy (SNT): a double-blinded randomized controlled trial. Am J Psychiatry 2022; 179:132-141*
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A CASE SERIES EXPLORING THE EFFECTS OF HIGH-FREQUENCY TRANSCRANIAL RANDOM NOISE STIMULATION IN PATIENTS WITH SCHIZOPHRENIA

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Background: One out of three patients with schizophrenia experiences symptoms which are refractory to conventional antipsychotic treatments. In such cases, transcranial direct current stimulation, a non-invasive brain stimulation technique, has been proposed as a novel therapeutic approach and has showed promising beneficial effects for reducing symptoms of schizophrenia, namely auditory hallucinations and negative symptoms. However, the high variability observed in clinical response leaves much room for optimizing stimulation parameters and strengthen its benefits. We propose to investigate the effects of high frequency transcranial random noise stimulation (hf-tRNS), which is supposed to induced larger effects than conventional direct current stimulation. Here, we present an initial case series of patients with schizophrenia who underwent hf-tRNS with the anode placed over the left dorsolateral prefrontal cortex and the cathode over the left temporoparietal junction.

Methods: Seven patients with schizophrenia according to DSM5 criteria (4 females, 3 males) presenting persistent symptoms received 10 sessions (2 sessions per day over 5 consecutive days) of 20 minutes hf-tRNS (2 mA, 100-500 Hz, 1 mA offset). Each patient underwent assessments of schizophrenia symptoms with the Positive and Negative Syndrome Scale (PANSS) and auditory hallucinations with the Auditory Hallucination Rating Scale (AHRS) at baseline and within 3 days after the final hf-tRNS session.

Results: Patients showed a significant mean reduction of total PANSS scores (-16 ± standard deviation 18%, p=0.039), mainly driven by a reduction in positive symptoms (-12±5%, p=0.002). Furthermore, they showed a significant reduction of auditory hallucinations (-33±24%, p=0.019).

Conclusions: The current case series suggests that hf-tRNS merits further investigation in the treatment of schizophrenia symptoms. However, additional work should investigate how some participant characteristics may affect outcome and therefore explain the observed variability in clinical response.

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CONCURRENT TMS-fMRI – SYSTEMATIC REVIEW OF METHODOLOGICAL DIFFERENCES AND SOURCES OF BIAS

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Introduction: Concurrent TMS-fMRI is a method which TMS pulses, bursts, or trains are interleaved with fMRI. Using this technique, the immediate effects of TMS can be measured while the subjects are being scanned with fMRI. To describe the methodological strengths and limitations across research, we conducted a systematic review on previously published concurrent TMS-fMRI studies.

Method: On April 16, 2021, literature was systematically collected from PubMED, Ovid Medline, and Embase. After deduplication, 4911 articles were included in a PRISMA screening and eligibility check was completed by two raters independently. 77 interleaved TMS-fMRI papers were identified. Out of those, 63 articles with at least 5 human subjects were examined in detail.

Results: A synopsis of studies may be downloaded from the link on the poster. Only four of the 63 publications were pre-registered, and only twelve were conducted with patients. Motor cortex research accounted for over half of the papers (28). There were three potential causes of bias that we discovered:

- different motor threshold (MT) measurements (31 with resting MT, 21 with MT in MR environment, 6 with electromyography),
- different motion control (35 stabilized the head with cushions or straps, 48 reported motion removal from fMRI image (i.e. removal of datasets with excessive motion, insertion of motion as covariate, denoising during preprocessing),
- lack or variation of control conditions (7 studies with sham TMS, 7 with low intensity, 7 with control location).

Discussion: To date, only 23 institutes in seven countries have published all of these studies. The majority investigated the motor cortex function in healthy subjects. Researchers are encouraged to collaborate not only to share their knowledge of the complex technological setting, but also to minimize the source of bias.

This study was supported by the Federal Ministry of Education and Research (BMBF): ERA-NET NEURON, FKZ: 01EW1903.

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