and the relative refractory period is 2-4 msec. Lower frequencies optimize repolarization recovery.
ECT is clinically administered at 20-70 Hz. Studies show 20-32 Hz is effective at triggering seizures with optimal treatment outcomes. Lower Hz also minimizes tissue damage from reduced power. The total charge delivered is affected by current amplitude, pulse width, frequency, and train duration. Shorter pulse widths (0.3 ms) reduce total energy and minimize tissue heating.
The neuronal soma is sensitive to electrical stimulation. Chronaxie is the minimum time that an electric current is applied to stimulate a neuron. Chronaxie is 0.2-0.3 msec. Aligning pulse frequencies with these values ensures stimulation with reduced adverse effects. The soma exhibits a lower spike threshold and shorter refractory period when facing prolonged steady depolarization, making it highly sensitive to pulse frequencies that align with its chronaxie values.
In contrast, axons have a higher density of voltage-gated Na+ channels that allow quicker recovery and shorter refractory periods. This high density enables axons to rapidly transmit action potentials, facilitating efficient neuronal signal propagation. Shorter axonal refractory period means they handle higher frequencies more effectively, but optimizing the overall frequency for ECT must balance the excitability of both the soma and axons.
Studies indicate that frequencies around 20-32 Hz are effective in initiating convulsive activity, aligning well with the end of the stimulus train. Frequencies over 50 Hz may suppress ictal activity and be inefficient in seizure induction due to "stimulus crowding," with neurons stimulated during their absolute refractory period.
Conclusions: Optimizing ECT pulse frequency is vital to balance therapeutic efficacy and safety. Fine-tuning ECT's electrical parameters enhances patient outcomes. Lower frequencies (20-32 Hz) are more effective to induce seizures and minimize adverse effects. 20-70 Hz in ECT is most clinically used, and lower end Hz could optimize results. Further frequency range research could lead to improved ECT protocols.

Disclosure of Interest: None Declared

EPP508

A Randomized Controlled Trial Comparing the Efficacy of High-Frequency rTMS and Intermittent Theta-Burst Stimulation on Depressive and Anxiety Symptoms in Depressive Disorder

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Introduction: Depressive disorder is one of the most prevalent neuropsychiatric conditions in the world, significantly affecting both individuals and society. Despite numerous therapeutic options, many patients do not respond adequately to treatment, highlighting the need for novel approaches, in the case of this study repetitive transcranial magnetic stimulation (rTMS).
Objectives: The main objective of this study was to compare the therapeutic efficacy of high-frequency rTMS (HF-rTMS) and intermittent theta-burst stimulation (iTBS) in reducing depressive and anxiety symptoms in patients with depressive disorder.
Methods: This double-blind, randomized controlled trial was conducted at the psychiatric ward of Most Hospital. Patients (N=97) diagnosed with depressive disorder were randomly assigned to receive either HF-rTMS or iTBS both aimed at left dorsolateral prefrontal cortex. Data were collected using both self-assessment and clinician-rated questionnaires, such as the Zung Self-Rating Depression Scale (ZSDS), Beck Anxiety Inventory (BAI), Hamilton Depression Rating Scale (HAMD), and Hamilton Anxiety Rating Scale (HAMA), before and after 10 stimulation sessions.
Results: The analysis showed a significant reduction in depressive and anxiety symptoms after ten stimulation sessions using both HF-rTMS and iTBS across all applied questionnaires. Specifically, the ANOVA results for the ZSDS demonstrated a significant decrease in symptoms over time ($F=414$, $p<.001$), with a mean reduction of 6.54 points (95% CI=4.64–8.43). Similarly, the HAMD scores showed a significant reduction ($F=299.72$, $p<.001$), with a mean reduction of 7.83 points (95% CI=5.79–9.87). For anxiety symptoms, the BAI revealed a significant decrease ($F=389.26$, $p<.001$), with a mean reduction of 5.72 points (95% CI=4.45–6.99) and the HAMA showed a similar trend ($F=656.15$, $p<.001$), with a mean reduction of 7.39 points (95% CI=5.58–9.20).
No significant difference in efficacy was found between the two stimulation protocols across all measures: ZSDS ($F=0.142$, $p=0.237$), HAMD ($F=0.431$, $p=0.376$), BAI ($F=0.269$, $p=0.365$), and HAMA ($F=0.813$, $p=0.370$).
Conclusions: This study confirms that both HF-rTMS and iTBS are effective in reducing depressive and anxiety symptoms, with no significant difference in their efficacy across all measured outcomes after ten stimulations. However, iTBS offers distinct advantages over HF-rTMS, including a shorter stimulation duration and a lower incidence of side effects.

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Rehabilitation and Psychoeducation

EPP511

Individual selection of augmentative and alternative communication for people with mental disabilities

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Introduction: More than 150,000 adults with mental disabilities live in social shelters in Russia and almost 50% of them do not use speech for communication and can't communicate at all. Social institutions lack a system for training those in need of Augmentative and alternative communication (AAC).
Objectives: Development and testing of an algorithm for selecting AAC method for adults with mental disorders and severe speech communication disorders.
Methods: A questionnaire for people with mental disabilities who do not use speech for communication was developed and tested. It included questions accompanied by illustrations, photographs