dystonia. The ERNA peak ratio negatively correlated with the UPDRSIII score.
Conclusions: This study identified disease- and site-specific differences in ERNA characteristics. The P1:P2 ratio, which negatively correlated with the UPDRSIII score, is of particular clinical relevance as it may serve as an indicator of GPe neuron recruitment efficiency. This ratio may guide real-time DBS parameter adjustments in a closed-loop manner.
Research Category and Technology and Methods
Translational Research: 1. Deep Brain Stimulation (DBS)
Keywords
Deep Brain Stimulation (DBS), Evoked Recurrent Neural Activity (ERNA), Basil Ganglia, Movement Disorders

http://dx.doi.org/10.1016/j.brs.2024.12.641

P1.203

INTEGRATING ADVANCED THERAPEUTICS FOR DRUG-RESISTANT EPILEPSY: GENE THERAPY, AI INNOVATIONS, AND NEUROPROTECTIVE STRATEGIES

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Abstract
This study aims to explore the integration of innovative technologies in the treatment of drug-resistant epilepsy, focusing on three major advanced techniques: gene therapy, use of artificial intelligence (AI), and advanced brain stimulation techniques. Gene therapy such as neuropeptide Y and galanin have been demonstrated in preclinical studies to have a positive effect on seizure activity. Efficient delivery of a transgene to target neurons also constitutes part of a successful gene therapy-based treatment. Advances have been made in the areas of cell transplantation and in the development of recombinant viral vectors for gene delivery. rAAV vectors gene therapy of neurological disorders owing to their neuronal tropism, lack of toxicity, and stable persistence in neurons, resulting in robust long-term expression of the transgene. offers potential for curative treatments through both gene editing and viral vectors.
AI advancements promise to revolutionize seizure management by predicting risks, personalizing treatment, and promoting nerve regeneration. such as VNS therapy, mjn-SERAS AI algorithm
The role of novel anticonvulsants drugs, including brivaracetam, Lamotrigine and Cenobamate, in seizure control and neuroprotective properties in neurological well-being is reviewed. Current brain stimulation technologies and emerging techniques aim at enhancing seizure control and preventing long-term neural damage.
Research Category and Technology and Methods
Clinical Research: 22. Neuropharmacology
Keywords
brain stimulation techniques, novel anticonvulsants, Gene therapy, long-term neural damage

http://dx.doi.org/10.1016/j.brs.2024.12.642

P1.204

PREDICTING THE IMPACT OF GPI DEEP BRAIN STIMULATION ON FREEZING OF GAIT IN PARKINSON'S DISEASE

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Abstract
Introduction
Freezing of gait (FOG) is one of the most debilitating symptoms of Parkinson's disease (PD), increasing the risk of fracture and falls. The clinical outcomes of FOG after deep brain stimulation (DBS) exhibit variability, and the response to globus pallidus internus (GPi) DBS may be influenced by individual differences in white matter structures and axonal modulation by DBS.
Methods
The study population included patients with PD who underwent GPi DBS from 2015 to 2020. We investigated the brain structural connectivity using diffusion tensor images and probabilistic tractography from pre-operative magnetic resonance imaging (MRI). We compared the structural connectivity between each brain region and volume of tissue activated (VTA) in patients with improved FOG and in those without after DBS stimulation. Additionally, it was investigated whether structural connectivity could predict the DBS stimulation effect through the use of machine learning models.
Results
We included 58 patients with PD with GPi DBS, and 45 patients had FOG before DBS. Median age at surgery was 62.0 years. The patients without improved FOG showed higher connectivity between VTA and right inferior parietal cortex (median 0.024 vs 0.010, P=0.009), somatosensory cortex (median 0.005 vs 0.002, P=0.05), and rostral medial frontal cortex (median 0.027 vs 0.008, P=0.03). The patients with improved FOG showed higher connectivity with left lateral visual cortex (median 0.007 vs 0.025, P=0.04) and left ventral inferior parietal cortex (median 0.008 vs 0.034, P=0.06). The prediction of FOG improvement using structural connectivity after DBS surgery showed an accuracy of 0.72 (sensitivity 0.86, specificity 0.47) using logistic regression model and accuracy of 0.74 (sensitivity 0.89, specificity 0.47) using support vector machines.
Conclusions
We found that the prediction of FOG improvement using structural connectivity showed moderate accuracy in machine learning models, indicating potential for preoperative connectivity patterns to guide therapeutic expectations.
Research Category and Technology and Methods
Clinical Research: 1. Deep Brain Stimulation (DBS)
Keywords
Freezing of gait, Structural connectivity, Deep brain stimulation

http://dx.doi.org/10.1016/j.brs.2024.12.643

P1.205

A CONSUMER-CENTERED QUALITATIVE EVALUATION OF TREATMENT OUTCOMES AND TRIAL PARTICIPATION EXPERIENCES IN AN INTERMITTENT THETA BURST STIMULATION THERAPY TRIAL FOR DEPRESSION

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Abstract
Introduction: Involvement of service end users, also known as consumers, patients and trial participants, in mental health research design and execution enables insights into consumer-specific concerns. Doing so improves experiences of trial participation and effective clinical translation. The collaborative co-design of research between consumers and investigators facilitates authentic evaluation of consumers' subjective and functional outcomes, which can inform future research priorities and designs. Few transcranial magnetic stimulation (TMS) trials in treatment-resistant depression (TRD) have engaged in such a consumer-centered evaluation incorporating co-design principles.
Methods: We undertook a consumer co-designed, qualitative evaluation in 15 participants who enrolled in a multisite, prospective, randomized clinical trial evaluating the effects of medication augmentation of intermittent theta burst stimulation (iTBS) to treat TRD (ClinicalTrials.gov ID: NCT05591677). Participants' qualitative experiences were evaluated using a semi-structured questionnaire, targeting 1) Depression symptoms and participants' subjective challenges, 2) Quality of life and functional outcomes, and 3) Experiences of trial participation. Qualitative analysis involved coding the participants' responses, which were clustered into categories then classified into themes and analyzed with reflexive