ANTICIPATED RESULTS: Weanticipatevaried responses: some enthusiastic about genetic research benefits, others having reservations due to privacy, cultural beliefs, or past experiences. A significant portion may express concerns about genetic research's impact on insurance and potential discrimination. We also expect to uncover systemic challenges that hinder participation among Hispanics living in PR, such as a lack of information or misconceptions about genetic research. This study will overview factors, both encouraging and inhibitory, influencing decisions to join genetic research. Quantitative genetic literacy survey data will undergo descriptive analysis and multivariate logistic regression. DISCUSSION/SIGNIFICANCE: Hispanics in PR exhibit a rich tapestry of genetic variations being a focal point for genetic research. Understanding perceptions is vital among those at risk for inherited conditions. Insights can shape outreach and education strategies, ensuring participants are informed, concerns met, and empowered to make decisions alignined their views.

414

Post-stroke Cognitive deficits are associated with reduced cognitive conflict evoked mid-frontal EEG theta oscillations and can be potentially improved with prefrontal transcranial electrical stimulation

Ishita Basu[1], Alexander Ross[1], Oluwole Awosika[1], Francisco Romo-Nava[2] and David Fleck[1]

[1]University of Cincinnati and [2]Linder Center of Hope University of Cincinnati

OBJECTIVES/GOALS: Cognitive dysfunction and/or depressionfollowing ischemic stroke results in loss of independence in daily functioning. The objective of this work is to assess neural correlates of post-stroke cognitive deficits and the effect of left frontal transcranial electrical stimulation on cognitive control and associated brain rhythms. METHODS/STUDY POPULATION: We recorded mid-frontal scalp EEG from 15 healthy and 13 participants with stroke while they performed a multi-source interference task (MSIT). The stroke cohort also performed additional MSIT sessions where they received active and sham transcranial direct current stimulation (tDCS) on the left prefrontal cortex (PFC). The EEG was preprocessed to get rid of eye movement and other channel noise artifacts and filtered to retain 0.5-55 Hz components. A Morlet wavelet was used to estimate power in theta (4-8 Hz), alpha (8-15 Hz) and gamma (35-50 Hz) frequency bands over a period of 2 seconds following MSIT image presentation. A generalized linear mixed effects model was used to find effect of group on behavior and EEG oscillations. A GLME was also used to find effects of active tDCS on behavior and EEG. RESULTS/ANTICIPATED RESULTS: We found Group (healthy v stroke) as a significant predictor of both response time (behavior) and conflict evoked theta power in the frontal channels (F1-Fz, F2-Fz). We also found that active tDCS significantly improved MSIT performance as compared to sham, after accounting for cognitive load. Active tDCS also induced low frequency oscillations in frontal EEG channels compared to sham. Preliminary results indicate that mid-frontal theta oscillations are a potential neural correlate of post-stroke cognitive deficit and tDCS of the left PFC might be a promising therapeutic intervention to ameliorate this. DISCUSSION/SIGNIFICANCE: Current therapeutic approaches often do not alleviate post stroke executive dysfunction, hence a better understanding of the brain network changes underlying such deficit can elucidate neural correlates of post stroke cognitive deficit to inform the development of neuromodulation interventions.

415

Intraoperative Molecular Imaging of Gliomas using Indocyanine-Conjugated Choline Kinase Alpha Inhibitor

Ritesh Karsalia[1], Ritesh Isuri[2], John Y.K. Lee[3] and Edward J. Delikatny[2]

[1]Perelman School of Medicine, University of Pennsylvania; [2]Department of Radiology, Perelman School of Medicine, University of Pennsylvania and [3]Department of Neurosurgery, University of Pennsylvania

OBJECTIVES/GOALS: Distinguishing tumor tissue from normal brain parenchyma remains a major challenge during the resection of gliomas, leading to the persistence of tumor cells. This study aims to assess the choline kinase alpha-targeting fluorophore JAS239 as a novel fluorescent agent to intraoperatively visualize gliomas in an orthotopic murine model. METHODS/STUDY POPULATION: The human glioblastoma-derived U87 MG-Luc2 cell line will be intracranially implanted in nude mice and tumor growth will be assessed using bioluminescence imaging. After 14 days, the mice will be treated with either antiangiogenic therapy (10 mg/kg bevacizumab, twice/week) or saline (control). Tumor growth will be monitored until 21-28 days after initial implantation, at which point JAS239 (4.0 mg/kg, 90 min before sacrifice) and Evans Blue (4 ml/kg, 60 min before sacrifice) will be administered. The mice will be sacrificed, and their brains will be harvested and sectioned for near-infrared imaging. The brain sections will be processed for histopathologic analysis, allowing for the correlation of observed fluorescence with the distribution of tumor and comparison of signal-to-background ratios. RESULTS/ANTICIPATED RESULTS: JAS239 is an indocyanine-based choline mimetic (excitation 745 nm, emission 775 nm) that has been shown to cross the blood-tumor barrier (BTB) in rodent glioblastoma studies. PET imaging with choline-based radiotracers like 18F-choline has also been shown to delineate both contrast-enhancing tumor (CET) and non-contrast-enhancing tumor (NCET) regions, supporting the hypothesis that JAS239 will be able to visualize heterogeneous glioma tissue in our mouse model. Evans Blue is a passive dye in the visible light spectrum (excitation 620 nm, emission 680 nm) expected to only fluoresce in CET regions due to the disruption of the BTB. JAS239 is expected to fluoresce in both CET and NCET regions, which will be assessed by the fluorescence in mice treated with bevacizumab (expected to renormalize the BTB and model NCETs). DISCUSSION/SIGNIFICANCE: JAS239 may allow for real-time visualization of heterogeneous glioma tissue, which is important because there are no current intraoperative imaging agents for NCETs. Future research and clinical translation of this class of agents may allow surgeons to maximize the safe resection of gliomas, improving progression-free and overall survival rates.

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