174. Pre-Surgical fMRI Brain Activation Predicts 12-Month Post-Bariatric Surgery Outcomes

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**Background:** For morbidly obese adults who fail to lose significant weight with diet/exercise and have secondary medical problems, bariatric surgery represent effective alternatives. Post-surgical success varies widely, but pre-surgical prediction of outcome using traditional medical, hormonal, socio-logical, personality or psychiatric data is inaccurate.

**Methods:** N=65 individuals BMI>35 were recruited from a Surgical Weight Loss Center and imaged pre-surgically in a Siemens Skyra 3T MRI. fMRI tasks included: 1. Resting State, 2. Gustatory Food Cues (GFC) to milkshake, 3. Monetary Incentive Delay (MID), 4. Regulation of Craving (RoC), 5. Affective Perception, 6. Visual Social Food Cues (VFC). 12m post-surgery follow-up assessed % total weight loss (%TWL) and key medical indices. fMRI tasks modeled 26 pre-selected, non-overlapping regions-of-interest (ROIs) in FSL-FEAT. Stepwise linear regression explored the relationship of ROI values to %TWL and change in fasting glucose, hemoglobin A1c, triglycerides, sleep apnea & hypertension, all values p<0.05 multiple-comparison corrected.

**Results:** 69% total variance in %TWL (F=12.099; p=3.5065E-10) was explained by combined fMRI brain activity in caudate, thalamus, hippocampus, anterior cingulate & orbitofrontal cortices during, MID, SFC, GFC and RoC tasks. No other hormonal, personality or psychiatric data entered the stepwise regression model. fMRI data predicted 54% of a more complex, PCA-derived outcome measure, comprising %TWL, quality of life and the above health information.

**Conclusions:** Consistent with a prior smaller pre-surgical fMRI study, we successfully predicted 69% of 12-month post-surgical %TWL using pre-hoc specified brain regions. Brain imaging measures may be useful in triaging bariatric surgical candidates to determine those needing additional pharmacologic or counseling support.

**Supported By:** IOL/ Hartford Hospital research award and NIDDK 1R01DK113408

**Keywords:** Obesity, Brain Imaging, fMRI, Bariatric Surgery, Cognitive Neuroscience, Obesity

175. Targeting the Gut-Brain Axis to Regulate Preference and Striatal Response to Fat

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**Background:** High fat diet (HFD) leads to disrupted striatal dopamine function and alterations in fat preference. One mechanism by which this occurs is depletion of gut lipid messengers, including oleoylthanolamine (OEA), which when replenished rescues dopamine response and increases preference for low fat emulsions via the generation of vagal afferent signals (Tellez et al., 2013). Using a supplement containing the OEA precursor N-oleyl-phosphatidylethanolamine and epigallocatechin-3-gallate (NOPE+EGCG), we tested whether this effect translates to humans and whether supplementation improves outcomes on a behavioral weight loss trial.

**Methods:** 67 individuals were randomized to a 9.5-month supplementation regimen with NOPE+EGCG or placebo and outcomes were assessed after supplementation alone (6 weeks), after a weight loss trial (4 months), and after a weight maintenance period (4 months). Neural response to milkshake was measured using fMRI.

**Results:** Directly replicating findings in rodents, compared to placebo, 6-weeks supplementation with NOPE+EGCG reduced fat intake and preference and increased dorsal striatal response to milkshake (Tellez et al., 2013). Additionally, individuals supplementing with NOPE+EGCG lost more weight overtime, achieving 5% weight loss following the trial and 8% loss following the maintenance period. Critically, this effect depended on history of saturated fat intake at enrollment, such that those eating a HFD benefited most from the supplement.

**Conclusions:** Consistent with findings in mice, our results demonstrate that targeting fatty acid-derived gut-brain communication can influence striatal response to fat, fat preference and fat intake and may have therapeutic potential for weight loss and regulation of striatal circuits in individuals consuming HFD.

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**Keywords:** Gut-Brain Axis, Obesity, Novel Treatments, Fatty Acid

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**SYMPOSIUM**

**Assessing the Risks and Benefits of Antipsychotic Medication on Brain and Body: Data From a Double Blind Randomized Placebo-Controlled Clinical Trial, and Convergent Data From an Animal Model**

**Chair:** Ellen Whyte

**12:30 p.m. - 2:30 p.m.**

176. Sustaining Remission of Psychotic Depression: The Stop-PD II Study

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