Data Analysis Plan:

Effectiveness of Deep Brain Stimulation for Treating People with Treatment-Resistant Obsessive-Compulsive Disorder

Butler Hospital
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Data Analysis Plan

Statistical Analysis: General Approach. The analysis approach is consistent with the ANCOVA model and implemented within a mixed effect regression model. We regress follow-up observation on baseline value of the outcome and treatment group, and the estimate of the treatment effect is derived from the regression coefficient for treatment assignment, and statistical significance by the ratio of parameter estimate to its standard error. We account for the within person correlation of the repeated observations using random effects. Control variables, in addition to baseline outcome and treatment condition, and a set of dummy variables for site. To ease interpretation, treatment effects are expressed as model-implied standardized effect sizes (expected mean difference at all follow-up timepoints divided by pooled baseline standard deviation) with 95% bootstrap confidence intervals (on 1,001 replications), and a two-sided P-value. Consistent with the intent-to-treat principle, all randomized persons are included in the analysis using maximum likelihood estimation procedures, which make use of the assumption that the reasons why persons are missing is not related to the value on the outcome we would have observed (had it been observed) given what we know about other observed data (i.e., their prior scores, other background variables).

Main treatment effect models. Using the mixed effect ANCOVA approach described above, we will report time-point specific and omnibus(over all time point) DBS treatment effect differences over the first 12 weeks of follow-up for the primary outcomes (YBOCS, GAF, SOFAS). The 12 week period defines the masked phase. We present time specific and omnibus tests (over all follow-up time). The same approach is used for the secondary outcomes (QLESQ, MADRS, HARS, PGI, CBAS, HDRS, CGI, GIT, BADS).

Effects of crossing sham to active. The design called for patients to be initially randomized to active DBS or sham. After 12 weeks of follow-up, patients randomized to the sham were converted to active DBS. We examine DBS treatment effects taking advantage of the delayed start of the initially-randomized-to-sham patients. Treatment effects will be analyzed using a linear regression models and piecewise time effects, coded specifically for each group and capturing regression to the mean (initial resolution of symptoms) and time from initiation of active DBS.