Neurocognitive Tasks: Novel Markers To Predict and Prevent Adolescent Suicidal Behavior

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Global adolescent death is not primarily due to cardiovascular diseases, cancer, or other infectious diseases, but from suicide–the 2nd leading cause of death in adolescents. However, no objective markers for adolescent suicide exists. This study investigated three neurocognitive tasks to evaluate all three core executive functions (EFs): Cambridge Neuropsychological Test Automated Battery Intra-Extra Dimensional Set Shift (CANTAB IED) assessed cognitive flexibility, Stop-Signal Task (SST) assessed impulsivity, and Letter-Number Sequencing (LNS) assessed working memory. Neurocognitive tasks were used as predictors of suicide ideation (SI) 3 and 6 months post-hospitalization in high-risk adolescents. Interactions of neurocognitive tasks within males vs. female groups were used to predict SI based upon sex. Adolescents (N=235) were administered the CANTAB IED, SST, LNS, Suicide Ideation Questionnaire, and other additional assessments at baseline during initial hospitalization, 3-month, and 6-month follow-ups. Linear regression models were developed using SPSS to predict SI. Regression models were strong predictors of 3-month and 6-month SI ($p < .001$). Lower CANTAB IED scores predicted 3-month SI ($p < 0.05$; Cohen's $f2 = 1.01$) in males and higher SST scores predicted 6-month SI in males ($p < 0.01$; Cohen's $f2 = 1.31$). No association was found between LNS and SI at 3-month or 6-month SI. CANTAB IED and SST were identified as effective, noninvasive, and low-cost objective markers for short-term SI. Sex-specific differences suggests interventions differing by sex could be especially helpful in decreasing male suicide risk. Future studies include assessments of the present study's suicide risk calculator to predict severity of suicide risk based on neurocognitive task scores.

Awards Won:

Fourth Award of $500

American Psychological Association: Third Award of $500