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Neural functional connectivity changes to psychological stress in young adults with bipolar disorder

Background: Stress is a strong predictor of illness onset, worse clinical course, and poor health outcomes in individuals with bipolar disorder. Yet there is a paucity of data investigating how stress affects brain function in bipolar disorder. This preliminary study investigated neural functional connectivity changes to an acute psychosocial stress in young adults with bipolar disorder and a typically developing comparison group.

Methods: 42 youth [n=19 (45%) with bipolar disorder, 71% female, mean age \pm SD= 21 \pm 2 years, age range=18-26 years] completed a modified version of the Montreal Imaging Stress functional MRI Task (MIST). Functional connectivity between regions of interest (bilateral orbitofrontal cortex and bilateral amygdala) was calculated for control and stress fMRI conditions for each subject. Main effects of stress and group by stress interactions on functional connectivity changes to stress were modeled, covarying sex, with functional connectivity during the control and stress conditions as a repeated dependent variable. Findings were considered significant at $p < 0.025$, Bonferroni correction.

Results: Stress was associated with increased connectivity between the right OFC and right amygdala in both groups (main effect of stress $p = .04$). Within bipolar disorder young adults, but not typically developing youth, stress was also associated with increased functional connectivity between the left amygdala and left OFC (group x stress interaction $p = .004$).

Conclusion: Preliminary results from this ongoing study demonstrate differences in frontolimbic functional connectivity responses to stress in young adults with bipolar disorder. Future longitudinal study is needed with larger samples, to investigate clinical implications of findings on outcomes.