

Bilateral amygdala connectivity during emotion reappraisal in MDD correlated with rumination

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Major depressive disorder (MDD) is characterized by an inability to effectively regulate responses to negative content. MDD is also frequently characterized by rumination about negative thoughts and experiences, which may be related to poor emotional regulation. Studies of emotion regulation have implicated abnormal amygdala connectivity in poor emotion regulation. The current study investigated whether amygdala functional connectivity (FC) during an emotion regulation task was related to rumination in children with and without MDD. Twenty MDD and 23 healthy (HC) children (8-14 years old) completed the Cognitive Emotion Regulation Questionnaire (CERQ), then performed an fMRI slow-event-related emotion regulation task with neutral and sad pictures. For reappraisal trials, a sad image was followed by a prompt to "Make Positive." fMRI data were motion scrubbed by removing volumes with framewise displacement greater than .9mm, slice-time and motion corrected, normalized, and smoothed with a 6mm FWHM Gaussian kernel. Contrasts for regulate vs baseline were used to create psychophysiological interaction (PPI) FC analyses using left and right amygdala seeds. Individual PPI results were entered into a multiple regression analysis to assess Group x CERQ rumination score interactions on amygdala FC. Interactions were seen bilaterally, with rumination in MDD more strongly correlated with medial and lateral prefrontal FC than in HC. This abnormal amygdala FC during directed emotion regulation suggests inefficient amygdala regulation, which may contribute to rumination in MDD children.