Generalized Anxiety Disorder Patients Show Neural Abnormalities During the Anticipation of Aversion

Introduction

Recent evidence suggests that generalized anxiety disorder (GAD) patients may have an exaggerated negative emotional response to aversive pictures. We aimed to investigate the neural correlates of anticipation of aversion in GAD patients and healthy controls using event-related functional magnetic resonance imaging (fMRI).

Materials and Methods

Participants consisted of 10 GAD subjects without comorbid depression and 10 age- and sex-matched healthy controls. The fMRI paradigm involved the presentation of aversive and neutral International Affective Picture System images. A minus sign was the warning for an aversive picture, while a circle was shown as the warning for a neutral picture. The anticipation period lasted for 2.5 seconds, followed by a 0.5-second interval before the presentation of the picture.

Results

Figs. 2 and 3 demonstrate the extent of overlap between anticipation of and exposure to aversive pictures in rACC (A), insula (B), and amygdala (C) regions for the control and GAD groups. The rACC showed a three-way interaction for a Group (Control, GAD) x Period (Anticipation, Picture) x Valence (Aversive, Neutral) effect. For GAD subjects, the anterior cingulate cortex (ACC) and insula showed heightened responses in anticipation of both aversive and neutral stimuli, suggesting indiscriminate activation in these regions. These results suggest a pattern of neural activity in anticipation and response to aversion.

Discussion

These findings support the hypothesis that GAD patients exhibit heightened neural activity in the anticipation of aversive stimuli, which may underlie their exaggerated negative emotional responses. Future research should explore how these abnormalities may contribute to the development and maintenance of GAD.