Anticipatory Anxiety Predicts Reduced Gaze Fixation on Aversive Stimuli in Generalized Anxiety Disorder

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Introduction

Generalized anxiety disorder (GAD) is characterized by excessive worry about the future supported by an attentional and behavioral bias toward threatening information (MacLeod et al. 1986). Previous functional brain imaging (fMRI) results within our lab suggest that individuals with GAD are hyper vigilant while anticipating emotional stimuli (Nitschke et al. under review) but then show a lack of reactivity during the presentation of those emotional stimuli, a finding most pronounced in the amygdala (Oathes et al. 2007; see Figure 1). These findings are consistent with both vigilance (MacLeod et al. 1986) and anxiety (Borkovec et al. 2004) theories of generalized anxiety, and warrant an attempt to understand the mechanisms by which individuals with GAD engage or disengage attention and therefore show a lack of response to emotional stimuli. The present study tracked participants’ eye movements during the presentation of aversive pictures from the International Affective Picture System (IAPS; Lang et al. 2005) in order to explore the underpinnings of this blunted response.

We hypothesized that individuals with GAD would fixate less on the negative aspects of the pictures as a function of their anxiety ratings due to a suggested connection between anxious vigilance and subsequent emotional avoidance tendencies in these patients. We expected this vigilance/avoidance tendency to be unique to individuals with GAD as compared to healthy controls.

Methods

Participants

Participants consisted of 6 patients (all female) and 7 healthy controls (2 females). Participants met criteria for DSM-IV diagnoses of GAD alone (4 patients) or GAD plus one or more past major depressive episode (2 patients) as assessed by the Structured Clinical Interview for the DSM-IV (First et al. 1996) and controls had no current, past, or family history of Axis I disorder.

Stimuli and Areas of Interest

The stimuli consisted of 54 aversive IAPS pictures. Each picture was presented to participants for 1 second as a part of an event-related fMRI study. Aviotech goggles (Avotec, Inc., Jensen Beach, FL) mounted on the head coil of a 3.0 Tesla GE SIGNA MRI were used to display the images. Warning stimuli included an X to signify the appearance of an event-related fMRI study design similar to the one-tailed). (n = 6, r = -.987, p = .0001). This pattern was also found in patients with GAD alone and no other current or past Axis I diagnoses (n = 4, r = .986, p = .001). This correlation did not approach significance in healthy controls (r = .271, p = .557) and there was a significant difference in the correlation magnitude between the two groups (p < .0001).

Figure 4. In GAD patients (GAD patients with no other current or past Axis I diagnoses and GAD patients with one or more past major depressive episodes), higher levels of anxiety during anticipation of aversive pictures were negatively correlated with time spent fixating on the aversive aspects of these pictures (n = 6, r = -.987, p = .0001).

Some findings support both hypervigilance (McLeod et al. 1986) and avoidance (Borkovec et al. 2004) theories of GAD and suggest an explanation for amygdala findings using fMRI in our lab (Nitschke et al. under review; Oathes et al. 2007). Specifically, GAD patients experience heightened anticipatory anxiety, which may then induce behavioral avoidance (reduced gaze fixation) resulting in a lack of emotional responsivity (amygdala activation) to aversive emotional stimuli.

Results

2. As predicted, participants with GAD fixed less on the negative aspects of the aversive pictures as a function of their heightened anticipatory anxiety ratings. These findings support both hypervigilance (McLeod et al. 1986) and avoidance (Borkovec et al. 2004) theories of GAD and suggest an explanation for amygdala findings using fMRI in our lab (Nitschke et al. under review; Oathes et al. 2007). Specifically, GAD patients experience heightened anticipatory anxiety, which may then induce behavioral avoidance (reduced gaze fixation) resulting in a lack of emotional responsivity (amygdala activation) to aversive emotional stimuli.

2. These findings were confirmed to participants diagnosed with GAD (including patients with GAD and one or more past major depressive episode), and were not found in healthy controls.

Conclusions

References