Abstract

NEURAL HYPERVIGIALNCE IN TARUMA-EXPOSED WOMEN

by

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Trauma-exposed people often experience hypervigilance, which is a tonic condition of elevated alertness and excessive scanning for potential threat. A cardinal feature of hypervigilance is that no actual threat is needed to evoke or maintain the over-alertness and heightened affective response. However, most neuroimaging research in trauma to date has only focused on reactivity to an actual threat. Thus, the overarching aim of this dissertation was to investigate neural signatures and salivary markers of post-trauma hypervigilance in the absence of threat that can cause impairment in daily functioning and contribute to developing other trauma-related symptoms such as heightened threat reactivity.

The specific goal of Study 1 was to investigate the mechanisms of neural hypervigilance in trauma-exposed people by testing the association between trauma exposure and a persistent amygdala hyperactivity to affectively information even when it becomes familiar. Trauma-exposed women (*n*=24) showed persistent amygdala activity to familiar neutral images, whereas no-trauma controls (*n*=20) showed efficient amygdala habituation. Thus, these data suggest that hypervigilant amygdala response to affectively ambiguous information, even when the information becomes familiar, might be a neural signature of post-trauma hypervigilance.

The specific goal of Study 2 was to investigate the potential role of cingulum and

uncinate fasciculus integrity in trauma-related neural hypervigilance, indexed by less discrimination between amygdala activation to novel and familiar affective images. Trauma-exposed women (*n*=22) showed less discrimination between novel and familiar negative images in the amygdala compared to no-trauma controls (*n*=20). In trauma-exposed women, less amygdala discrimination between novel and familiar affective images was associated with less structural integrity in the anterior cingulum. Therefore, the anterior cingulum might play an important role in impaired novelty discrimination for affective information in the amygdala that might potentially lead to persistent hypervigilance.

The specific goal of Study 3 was to test the utility of salivary alpha amylase and cortisol as potential biomarkers that predict neural hypervigilance in trauma-exposed people. In trauma exposed women (*n*=20), salivary alpha amylase reactivity was associated with neural reactivity in the salience network in response to negative scenes and neural hypervigilance as indexed by response to neutral scenes. These results suggest that salivary alpha amylase might serve as a marker of trauma-related reactivity to threat, and also as a marker of hypervigilance in the absence of threatening information.

Taken together, these data contribute to our understanding on neural mechanisms of tonic vigilance and maladaptive affect in trauma survivors, and opens the possibility of using salivary alpha amylase as a biomarker of hypervigilance.