Changes in basolateral amygdala reactivity over time following trauma: evidence for a dynamic model

TWO OPPOSING HYPOTHESES:
1. Trait differences in amygdala threat response predict PTSD and persist over time.
2. Dynamic changes in threat response over time impact or reflect symptoms.

BACKGROUND
• Amygdala hyperreactivity early post-trauma -> physiological correlate of PTSD.
• But there is little evidence regarding how dynamics of amygdala reactivity over time relate to longitudinal PTSD symptomology.

METHODS
Timeline
- Recruitment in ED
- 2 weeks post-trauma: MRI Scan PCL-5
- 6 months post-trauma: MRI Scan PCL-5

• As part of larger, multisite study, AURORA, participants were enrolled in the emergency department (ED) within 72 hours of a traumatic event.

fMRI
- Fearful vs. neutral faces task.
- BLA and CeA nuclei ROIs analyzed.

PTSD Checklist for DSM-5 (PCL-5)
- Self-report measure of PTSD symptoms.

RESULTS

Figure 1. 2-week PCL-5 negatively correlates with 6-month left BLA reactivity. No significant correlations for CeA or right BLA.

Figure 2. 6-month PCL-5 negatively correlates with 6-month left BLA reactivity. No significant correlations for CeA or right BLA.

Figure 3. A decrease in left BLA reactivity from 2 week to 6 months predicted 6-month PCL-5. Neither 2-week CeA or BLA reactivity predicted PCL-5 scores.

Figure 4. left BLA reactivity and changes across 2-week and 6-month time points:

CONCLUSIONS
• Findings suggest PTSD symptoms persist in individuals who show a strong decrease in left BLA reactivity.
• Findings support a dynamic model of threat response changes post-trauma in PTSD.
• The left BLA may experience a form of exhaustion in those with chronic PTSD, potentially due to downregulation of norepinephrine or glutamate receptors in response to chronic stress.

ACKNOWLEDGEMENTS: This research was funded by AURORA grant, U01 MH110925, US Army Medical Research and Material Command, The One Mind Foundation, F31 MH126623

CONTACT: aroeckn@emory.edu