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

A. Roeckner[1], R. Hinrichs[1], T. Ely[1], S. van Rooij[1], N. Harnett[3], L. Lebois[3], V. Murty[4], T. Jovanovic[5], S. House[6], S. Mclean[2], K. Koenen[7], R. Kessler[8], K. Ressler[3], J. Stevens[1]

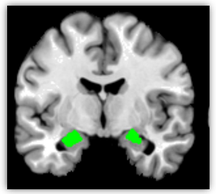
[1]Emory University School of Medicine, Atlanta, GA, [2]University of North Carolina School of Medicine, Chapel Hill, NC, [3]McLean Hospital, Harvard Medical School, Belmont, MA, [4]Temple University, Philadelphia, PA, [5]Wayne State University, Detroit, MI, [6]Washington University School of Medicine, St. Louis, MO, [7]Harvard School of Public Health, Boston, MA, [8]Harvard Medical School, Boston, MA

EMORY UNIVERSITY SCHOOL OF MEDICINE

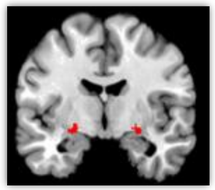
GRADY trauma PROJECT

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.



Basolateral amygdala (BLA): fear processing/ memory



Central amygdala (CeA): Autonomic fear response

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.

METHODS

Timeline

- 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

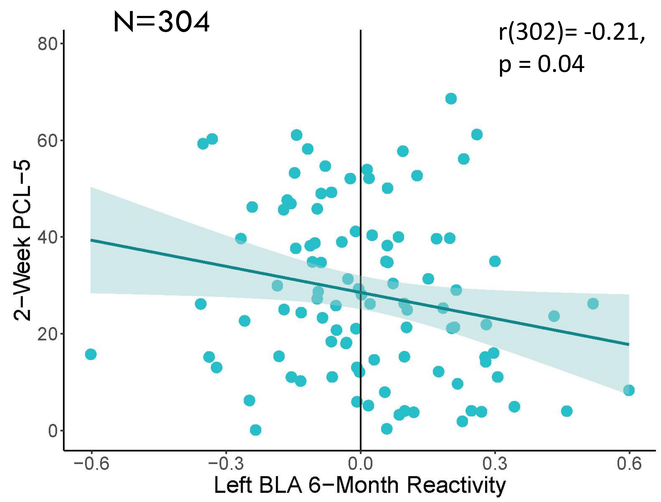


Figure 1. 2-week PCL-5 negatively correlates with 6-month left BLA reactivity. No significant correlations for CeA or right BLA.

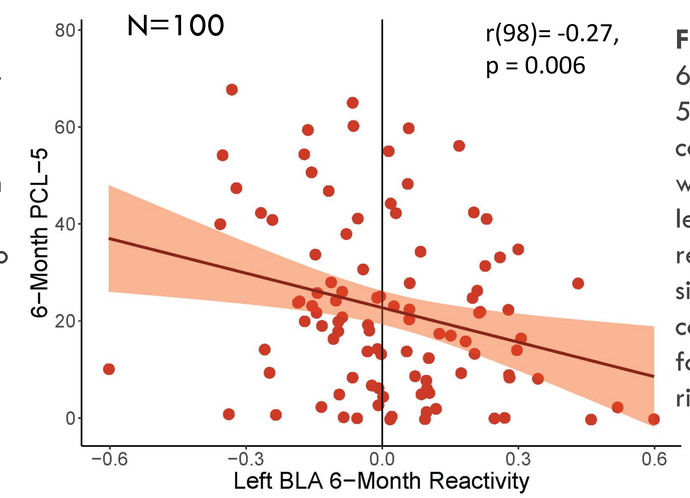


Figure 2. 6-month PCL-5 negatively correlates with 6-month left BLA reactivity. No significant correlations for CeA or right BLA.

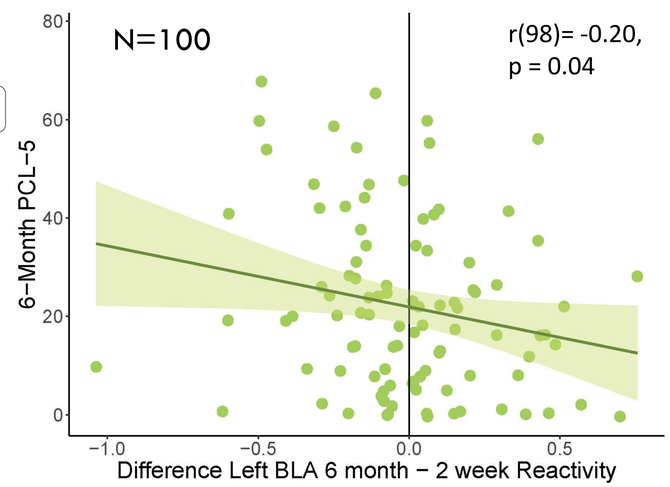


Figure 3. A decrease in left BLA reactivity from 2 week to 6 months predicted 6-month PCL-5. Neither 2-week CeA or BLA reactivity predicted PCL-5 scores.

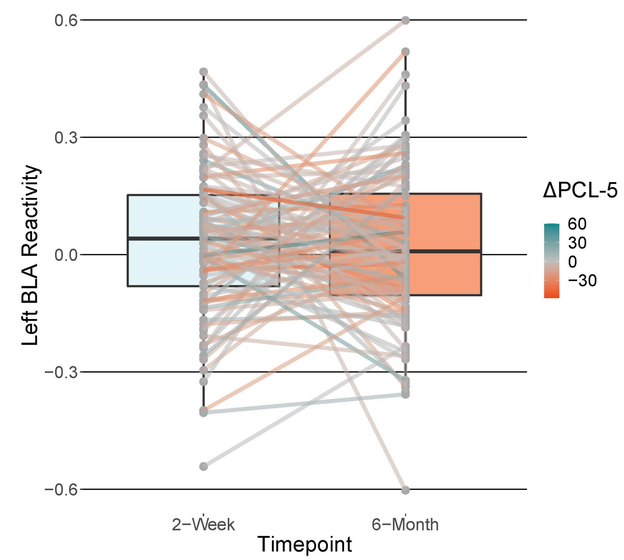


Figure 4. left BLA reactivity and changes across 2-week and 6-month time points:

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.

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CONTACT:
aroeckn@emory.edu