Rumination is Associated with PTSD Severity, Symptom Clusters, & Self-Related Brain Structures

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INTRODUCTION

• Previous research has associated the occurrence of rumination with PTSD¹.
• Neuroimaging studies have consistently implicated the rostral anterior cingulate (rACC) and posterior cingulate (PCC) in self-related thought, including rumination²,³.
• Previous functional imaging studies have found abnormal brain activity in these self-related brain regions in PTSD².
• No research to date has examined rumination and structural brain measures in relation to PTSD severity and symptom clusters.

PREDICTIONS

• Rumination will be significantly different between PTSD and trauma-exposed groups.
• Rumination will be related to PTSD severity and symptom clusters.
• Rumination will be related to self-related brain structures.

MATERIALS & METHODS

Participants

• We tested eighty-nine adults diagnosed with PTSD or exposed to trauma with no PTSD diagnosis (Table 1).

Ruminative Thought Style (Brinker & Dozois, 2009)⁴

• Participants completed the ruminative thought scale, a 20 item questionnaire that assesses global rumination (e.g., “My mind has been going over things again and again” or “I have never been able to distract myself from unwanted thoughts”).

Structural MRI

• We collected high-resolution T1-weighted structural images on a 3T Siemens Tim Trio MRI scanner.

Cortical Thickness and Regression Analyses

• We computed cortical thickness and volume for each subject in Freesurfer, version 5.1, as described previously⁵. Based on our apriori hypotheses, we focused on the rostral anterior cingulate (rACC) and posterior cingulate (PCC) regions of interest (ROIs) from the Desikan-Killiany Atlas⁶.

Statistical Analyses

• We conducted a two sample t-test to examine group differences in rumination between PTSD and trauma-exposure.
• We computed correlations to investigate the associations between rumination and PTSD symptom severity and clusters.
• We conducted partial correlations, including age and depression, to examine the relationship between rumination and self-related brain structures.

Table 1. PARTICIPANT CHARACTERISTICS

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Age (SD)</th>
<th>CAPS Total (SD)</th>
<th>CAPS RE (SD)</th>
<th>CAPS A (SD)</th>
<th>CAPS H (SD)</th>
<th>BDI-II (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTSD</td>
<td>73</td>
<td>32.0 (9.5)</td>
<td>67.0 (17.1)</td>
<td>17.7 (6.6)</td>
<td>26.9 (8.1)</td>
<td>22.3 (6.5)</td>
<td>25.0 (10.3)</td>
</tr>
<tr>
<td>Trauma-Exposed</td>
<td>16</td>
<td>31.6 (9.6)</td>
<td>21.8 (14.5)</td>
<td>5.2 (5.5)</td>
<td>7.7 (5.9)</td>
<td>8.9 (5.5)</td>
<td>10.9 (5.1)</td>
</tr>
</tbody>
</table>

CONCLUSIONS

• These results are consistent with previous clinical and neuroimaging studies associating PTSD with rumination and altered activity in self-related brain regions¹-³.
• Given the significance of negative self-related cognition in PTSD, future research will be necessary to investigate whether negative self-thought and self-related brain activity and structure are related to reduced PTSD symptoms after successful treatment.

REFERENCES

5. https://surfer.nmr.mgh.harvard.edu/fswiki

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