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Pathologic tearfulness after limbic encephalitis

A novel disorder and its neural basis

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Study objective and summary result

This study investigated the previously unexplored profile of pathologic tearfulness following autoimmune limbic encephalitis (a-LE) and tested the hypothesis that it is associated with abnormalities in the hippocampus, the amygdala, the hippocampal-diencephalic-cingulate networks, and the cerebro-ponto-cerebellar loops. The results identified neural correlates of post–a-LE pathologic tearfulness that were consistent with this hypothesis.

What is known and what this paper adds

Patients with histories of a-LE commonly report experiencing readily provoked tearfulness, but it may be misdiagnosed as a symptom of depression or disinhibition, and its neural correlates are unclear. This investigation elucidates the nature and neural correlates of post–a-LE tearfulness.

Participants and setting

The investigators recruited 38 patients with a-LE (68.4% male; median age, 63.06 years; interquartile range, 16.06 years) and 67 age- and sex-matched healthy controls (59.7% male; median age, 64.70 years; interquartile range, 19.87 years). The patients were recruited during the postacute phase of a-LE. Assessments were conducted at Oxford University.

Design, size, and duration

The patients and healthy controls completed questionnaires about emotion regulation and underwent structural and functional MRI scans. Pearson and Spearman correlation analyses were used to test for relationships between questionnaire scores and other variables, including MRI data.

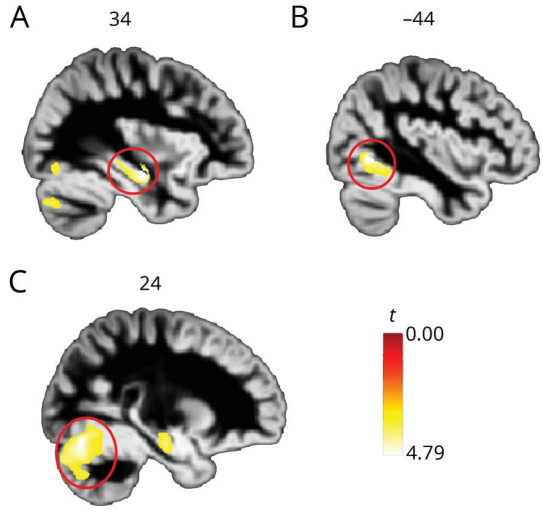
Primary outcome measures

The primary outcomes were relationships among pathologic tearfulness, depression/impulsiveness, and brain abnormalities.

Main results and the role of chance

Fifty percent of the patients complained of readily provoked tearfulness. Pathologic tearfulness was not a function of depression or impulsiveness, but was associated with reduced volumes in the right anterior hippocampus, left fusiform gyrus, and cerebellum; abnormal hippocampal resting-state functional connectivity with the posteromedial cortex and right middle frontal gyrus; and abnormal hemodynamic activity in the left fusiform gyrus, right inferior parietal lobule, and ventral pons.

Figure Tearfulness-associated gray matter atrophy in the right anterior hippocampus (A), left fusiform gyrus (B), and cerebellum (C)



Bias, confounding, and other reasons for caution

Some of the neuropsychological tests used in the present study might have lacked the sensitivity necessary to detect abnormalities associated with pathologic tearfulness.

Generalizability to other populations

The present study's single-center nature may limit the generalizability of the results.

Study funding/potential competing interests

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A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The corresponding author(s) of the full-length article and the journal editors edited and approved the final version.

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