

ANTERIOR HIPPOCAMPAL CONNECTIVITY AND RESPONSE TO FRUSTRATION IN MAJOR DEPRESSION

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Introduction: Major depressive disorder (MDD) is associated with low frustration tolerance, which is a risk factor for suicide. Hippocampal structural and functional abnormalities have been documented to play one of the crucial roles in the pathophysiology of depression. Recent studies have revealed functional differentiation of the hippocampus. Thus, activity of the anterior part was shown to be associated with negative affect mediation.

Objectives: To investigate brain mechanisms of frustration, comparing its impact on anterior hippocampal connectivity in MDD patients and healthy controls (HCs).

Methods: 14 MDD and 14 HC right-handed subjects were included in the study and underwent comprehensive clinical assessment. MDD was diagnosed during psychiatric interview according to ICD-10 criteria. The Hamilton Depression Rating Scale was additionally used to assess depressive symptoms. The original Stroop test was modified to evoke a state of frustration by administering impossible task conditions and negative feedback during 10-min functional magnetic resonance scanning session. Psychophysiological interactions were used to analyze left and right anterior hippocampal functional connectivity changes in response to frustration. The resulted Z-maps were adjusted using $Z > 2.3$ threshold and a (corrected) cluster significance threshold of $p = 0.05$.

Results: Increased functional connectivity of the left anterior hippocampus in response to frustration was significantly higher in MDD patients compared to HCs in the pars opercularis of the right prefrontal cortex and bilateral posterior cingulate regions.

Conclusion: The results revealed that depressed patients demonstrate abnormally increased anterior hippocampal response to frustration, suggesting that hippocampal-neocortical network impairment may contribute to decreased frustration tolerance associated with MDD.