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Lesion Network Mapping of Cotard's Delusion: Unique and Shared Neural Circuits in Nihilistic Delusions, Misidentification Delusions, and Altered Consciousness

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Abstract

Cotard's delusion, featuring delusions of nonexistence, is rare and not well understood. We used lesion network mapping (LNM) to investigate how focal lesions disrupt large-scale circuits in CD and compared them with other neuropsychiatric conditions. Nineteen lesion-induced CD cases were identified from a systematic review; each lesion was mapped to a standard template, and resting-state fMRI from 1,000 healthy subjects provided functional connectivity. A group-level CD map was defined by stringent sensitivity and specificity thresholds, which then served as a seed for connectivity analysis. We assessed spatial correlations with 31 published lesion-network datasets. A CD-specific network emerged in the right inferior frontal cortex, anterior insula, anterior temporal pole, and temporoparietal junction. Strongest overlaps were observed with Capgras delusion, akinetic mutism, mania, and loss of consciousness, reflecting shared disruptions in self-awareness and salience processing. Unique peaks in the temporoparietal junction and frontal operculum highlight CD's distinct nihilistic features.

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