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Analysis of Cognitive Impairment in Psychotic Disorders: Exploring Microcircuit Dysfunction and Dysconnectivity

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Abstract

Cognitive impairment represents a profound challenge in psychotic disorders, signi f cantly impacting daily functioning and quality of life. This article explores the intricate mechanisms underlying cognitive de f cits, focusing on microcircuit dysfunction and dysconnectivity within the brain. Psychotic disorders such as schizophrenia are characterized by disruptions in perception, thought, and emotion, alongside pervasive cognitive de f cits across domains including memory, attention, and executive function. Recent research highlights the role of microcircuits small-scale neural circuits in mediating these cognitive impairments. Dysfunctional microcircuits in key brain regions like the prefrontal cortex, hippocampus, and thalamus contribute to disrupted neural signaling and connectivity patterns, impairing cognitive processes. The dysconnectivity hypothesis posits that abnormal interactions between brain regions further exacerbate cognitive dysfunction in psychosis. Functional imaging studies reveal altered connectivity within networks crucial for cognition, such as the default mode network and salience network. Neurochemical imbalances, including dopamine dysregulation and glutamatergic dysfunction, also play pivotal roles in cognitive de f cits. Current treatments, while primarily targeting psychotic symptoms, have limited e f cacy in addressing cognitive impairment. Future research directions involve re f ning neuroimaging techniques, identifying biomarkers for cognitive outcomes, and developing neuroprotective strategies to enhance synaptic plasticity and mitigate cognitive decline. Understanding these complex neurobiological mechanisms is critical for advancing therapeutic approaches tailored to improve cognitive function and overall outcomes in individuals with psychotic disorders.

Keywords:

Introduction

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Microcircuit dysfunction in psychotic disorders

Neural circuit abnormalities

Prefrontal cortex:

Hippocampus:

alamus:

Dysconnectivity hypothesis

Functional connectivity

Default mode network: 617( )-3( ) 0.018 -1.575 0 0 56.6 2

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