

Neuroinflammation in Late-Life Depression: The Role of Glial Cells

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Abstract : Late-life depression (LLD) is a prevalent mental disorder among the elderly, frequently accompanied by significant cognitive decline, and has emerged as a worldwide public health concern. Microglia, astrocytes, and peripheral immune cells play pivotal roles in regulating inflammatory responses within the central nervous system (CNS) across diverse cerebral disorders. This review commences with the clinical research findings and accentuates the recent advancements pertaining to microglia and astrocytes in the neuroinflammation process of LLD. The reciprocal communication network between the CNS and immune system is of paramount importance in the pathogenesis of depression and cognitive decline. Stress-induced downregulation of tight and gap junction proteins in the brain results in increased blood-brain barrier permeability and impaired astrocyte function. Concurrently, activated microglia release inflammatory mediators, initiating the kynurenine metabolic pathway and exacerbating the quinolinic acid/kynurenic acid imbalance. Moreover, the balance between Th17 and Treg cells is implicated in the preservation of immune homeostasis within the cerebral milieu of individuals suffering from LLD. The ultimate objective of this review is to present future strategies for the management and treatment of LLD, informed by the most recent advancements in research, with the aim of averting or postponing the onset of AD.

Keywords : neuroinflammation, late-life depression, microglia, astrocytes, central nervous system, blood-brain barrier, Kynurenine pathway

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