

Immunomodulatory potential of mesenchymal stem cells on microglia

ABSTRACT

It is becoming increasingly evident that inflammatory reactions of microglia contribute to the pathology of neurodegenerative diseases. Although the focus for rescuing neurones previously lied on minimising direct insult (including limiting aggregation of misfolded proteins and antagonising the effects of glutamate), therapeutic approaches now include moderating the ensuing inflammatory responses of microglia. Microglia responses in the central nervous system (CNS) are diverse and their involvement in both neuroprotection and neurotoxicity may seem paradoxical. Accordingly, management of neuroinflammation must include an understanding of conditions that trigger neurotoxic responses by microglia and deciphering strategies to maintain their neuroprotective phenotype. Mesenchymal stem cells (MSC) are stem cells with great capacity for immunomodulation on a wide range of immune cells. Evidence presented here highlights the potential of using MSC to modulate the inflammatory responses of microglia. The mechanisms underlying the ability of MSC to moderate microglia responses are also explained in this review. Although many aspects of this approach will require defined characterisation, MSC serve as a potential cell-based therapy that may slow or halt the progression of inflammatory CNS diseases.

Keyword: Microglia; MSC; Immunomodulation; Inflammation; Central nervous system