Madeha Ishag Adam Abdalrahim

Fujian Medical University
China

Glial cell line-derived neurotrophic factor and brain- derived neurotrophic factor regulate the interaction between astrocytes and Schwann cells at the trigeminal root entry zone

Abstract:

The trigeminal root entry zone is the zone at which the myelination switches from peripheral Schwann cells to central oligodendrocytes. Its special anatomical and physiological structure renders it susceptible to nerve injury. The etiology of most primary trigeminal neuralgia is closely related to microvascular compression of the trigeminal root entry zone. This study aimed to develop an efficient in vitro model mimicking the glial environment of trigeminal root entry zone as a tool to investigate the effects of glial cell line-derived neurotrophic factor and brain-derived neurotrophic factor on the structural and functional integrity of trigeminal root entry zone and modulation of cellular interactions. Primary astrocytes and Schwann cells isolated from trigeminal root entry zone of postnatal rats were inoculated into a two-well silicon culture insert to mimic the trigeminal root entry zone microenvironment and treated with glial cell line-derived neurotrophic factor and brain-derived neurotrophic factor. In monoculture, glial cell line-derived neurotrophic factor promoted the migration of Schwann cells, but it did not have effects on the migration of astrocytes. In the co-culture system, glial cell line-derived neurotrophic factor promoted the bidirectional migration of astrocytes and Schwann cells. Brain-derived neurotrophic factors markedly promoted the activation and migration of astrocytes. However, in the co-culture system, brain-derived neurotrophic factor inhibited the migration of astrocytes and Schwann cells to a certain degree. These findings suggest that glial cell line-derived neurotrophic factor and brain-derived neurotrophic factor are involved in the regulation of the astrocyte-Schwann cell interaction in the co-culture system derived from the trigeminal root entry zone. This system can be used as a cell model to study the mechanism of glial dysregulation associated with trigeminal nerve injury and possible therapeutic interventions.

Biography

Madeha has completed her master's degree in neurology from Fujian Medical University and MBBS from University of Gezira. She is a member of Sudanese medical association. Also, I am a member of OWSD. She has published several research papers in reputable journals.