Mini Review

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Journal of Current Neurobiology

2021
Vol.1 No.2 : 9

Preterm Birth and Perinatal Brain Injury

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Received: October 18, 2021; **Accepted:** November 02, 2021; **Published:** November 09, 2021

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Citation: Das N (2021) Preterm Birth and Perinatal Brain Injury. J Curr Neur Biol. 2021, 1:2:9

Introduction

Chorioamnionitis is a leading cause of premature birth and brain damage. Bacterial invasion of the chorion, amnion, and/or placenta can cause a foetal inflammatory response, which can have serious consequences for the developing foetal brain. As a result, chorioamnionitis, preterm brain injury, and the development of severe postnatal neurological deficits and cerebral palsy are all strongly linked [1].

There are as of now no treatments available to protect or repair brain injury in preterm infants born after a pregnancy compromised by intrauterine infection. The harmful cascade of events in the preterm brain in response to a severe foetal inflammatory event. We will demonstrate personal periods of increased vulnerability, as well as the potential effects of cell-based therapies for therapeutic intervention. The several clinical trials are being conducted to investigate the efficacy of stem cells in the treatment of cerebral palsy patients [2-4].

Stem cells derived from umbilical cord tissue and cord blood, which are normally discarded after birth, are gaining popularity as a potentially safe and effective therapy. However, it is unknown which stem cell types are most effective in treating preterm infants with brain injury-mediated inflammation. Each stem transplanted cells found in cord blood and tissue, such as mesenchymal stem cells (MSCs) and endothelial progenitor cells (EPCs), have the potential to treat premature infants with inflammatory-induced brain injury. MSCs have potent immunomodulatory properties, protecting the foetus from infection-induced global and local neuroinflammatory cascades. EPCs are ideal for neurovascular repair because they have angiogenic and vascular reparative properties. A combination treatment that utilises both MSCs and EPCs to target inflammation all the while promoting angiogenesis for the re-establishment of vital vessel networks is a promising treatment concept that deserves further research [5].

Prematurity is still to blame for up to 70% of perinatal deaths, as well as poor neurodevelopmental outcomes and cerebral palsy in survivors. After birth, there are no clinical treatments available to protect or repair the brains of preterm infants. Furthermore, while survival rates for very/extremely preterm infants have improved, a recent review discovered that the prevalence of CP in this population has remained stable. Chorioamnionitis, an inflammation of the placenta and its membranes, has been linked to 40–70% of preterm birth complications. Chorioamnionitis is inextricably linked to preterm birth, with chorioamnionitis rates being inversely related to foetal gestational age and preterm birth [6].

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