

## **BRAIN TISSUE RECOVERY IN OBSTRUCTIVE CONGENITAL HYDROCEPHALUS AFTER INTRAVENTRICULAR TRANSPLANTATION OF MESENCHYMAL STEM CELLS**

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**Introduction:** Bone marrow-derived mesenchymal stem cells (BM-MSc) are a potential therapeutic tool due to their ability for migrating and producing neuroprotector factors when transplanted. The aim of this study was to evaluate the short-time effects of a BM-MSc experimental therapy in the hyh mouse model with severe obstructive hydrocephalus.

**Methods:** BM-MSc were characterized in vitro and then injected into the ventricles of hyh mice. Wild-type and saline-injected hyh mice were used as controls. Samples were studied by analyzing and comparing mRNA, protein and metabolites level expression in control and damaged tissue.

**Results:** Undifferentiated BM-MSc were found to: i) spread into the periventricular astrocyte reaction region after four days post-injection, and, ii) be producing neuroprotector factors (GDNF and VEGF). Astrocytes located in periventricular edematous region increased their aquaporin-4 expression, as well as Slit2 expression (neuroprotective and anti-inflammatory molecule). There was also a significant reduction of osmolytes such as taurine and neuroexcitotoxic glutamate. Halved apoptotic cell death was detected in the periventricular walls.

**Conclusions:** BM-MSc lead to recovery of the severe neurodegenerative conditions associated to congenital hydrocephalus mediated by reactive astrocytes.

Supported by Universidad de Málaga. Campus de Excelencia Internacional Andalucía Tech, and PI15/0619 (ISCIII/FEDER).