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11-08-2008, 04:02 PM #1

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Infusion of human umbilical cord blood cells ameliorates hind limb dysfunction

Pediatr neonatol. 2008 Jun;49(3):77-83.

Infusion of human umbilical cord blood cells ameliorates hind limb dysfunction in experimental spinal cord injury through anti-inflammatory, vasculogenic and neurotrophic mechanisms.

Chen CT, Foo NH, Liu WS, Chen SH.
Department of Pediatrics and Stem Cell Lab, Chi Mei Medical Center, Yung Kung City, Tainan, Taiwan.

BACKGROUND: Human umbilical cord blood cells (HUCBCs) were used to investigate the mechanisms underlying the beneficial effects of cord blood cells in spinal cord injury (SCI). METHODS: Rats were divided into three groups: (1) sham operation (laminectomy only); (2) Laminectomy+SCI+human adult peripheral blood mononucleocytes (PBMCs) (5 x 10⁶)/0.3 mL; and (3) Laminectomy+SCI+HUCBCs (5 x 10⁶)/0.3 mL. SCI was induced by compressing the spinal cord for 1 minute with an aneurysm clip calibrated to 55 g closing pressure. HUCBCs were infused immediately after SCI via the tail vein. Behavioral function tests measuring the maximal angle at which an animal could hold onto the inclined plane were conducted on days 1, 4 and 7 after SCI. Serum levels of tumor necrosis factor (TNF)-alpha and interleukin (IL)-10, were assayed. Furthermore, to determine if glial cell line-derived neurotrophic factor (GDNF) or vascular endothelial growth factor (VEGF) could be detected in the spinal cord injured area after systemic HUCBC infusion, analysis of these two molecules was conducted by immunofluorescence. RESULTS: Systemic HUCBC infusion significantly attenuated SCI-induced hind limb dysfunction. The serum IL-10 levels were increased, but TNF-alpha levels were decreased after HUCBC infusion. Both VEGF and GDNF could be detected in the injured spinal cord after transplantation of HUCBC, but not PBMC, cells. CONCLUSION: Our results demonstrate that HUCBC therapy may be beneficial for the recovery of SCI-induced hind limb dysfunction by increasing serum levels of IL-10, VEGF and GDNF in SCI rats.

http://www.ncbi.nlm.nih.gov/pubmed/1...ubmed_RVDocSum

"As the cast of villains in SCI is vast and collaborative, so too must be the chorus of hero's that rise to meet them" Ramer et al 2005

