Spinal Injuries Respond To Cell Transplantation

A study published in a recent issue of *Cell Medicine* reports on the therapeutic efficacy of stem cell transplantation for spinal cord injury (SCI).

Transplantation of mesenchymal stem cells (MSCs), multi-potent stem cells with the ability to differentiate into a variety of cell types with renewal capacities, has been found to enhance laboratory animal function after induced spinal cord injury. However, the biological mechanism of the functional enhancement has not been clearly defined. In an attempt to gain a clearer picture of the mechanism, a team of Korean researchers transplanted MSCs derived from human umbilical cord blood into the tail veins of laboratory rats immediately after spinal cord injury. The intravenous route was selected because the researchers felt that injection into the damaged site could further traumatize the injured spinal cord, although intravenously injected MSCs risk being eliminated by the host immune system.

"We found that MSCs express immunomodulatory effects during the acute phase following SCI," said study corresponding author Dr. Sung-Rae Cho of the Yonsei University College of Medicine in Seoul, Korea. "In our study, MSCs suppressed activated micoglia and inflammatory cytokines, increased anti-inflammatory cytokines and, consequently, promoted functional recovery in SCI rats." They reported "modest but significant improvement" in a number of functional test scores in the rats subjected to transplantation when compared with control group animals not subjected to cell transplantation. The researchers suggested that their study not only confirmed the established link between microglial activation and inflammatory cytokines, but also demonstrated that functional recovery might be attributed to immunomodulatory effects rather than cell replacement. They also recommended that autologous (self-donated) MSCs, rather than human-derived MSCs, should be used in subsequent studies to "suppress undesirable immune response."

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