

White matter infarct

White matter infarct induces demyelination and brain dysfunction.

Xu et al. previously reported that transplantation of brain microvascular endothelial cells (MVECs) improved the behavioral outcome and promoted remyelination via increasing the number of oligodendrocyte precursor cells in the rat model of white matter infarct.

In a study, Xu et al. investigated the effects of transplantation of vascular endothelial cells generated from human induced pluripotent stem cells (iPSCs) on the rat model of white matter infarct. Seven days after induction of ischemic demyelinating lesion by injection of endothelin-1 into the internal capsule (IC) of a rat brain, iPSC-derived vascular endothelial cells (iVECs) were transplanted into the site of demyelination. The majority of iVECs transplanted into the IC survived for 14 days after transplantation when traced by immunohistochemistry for a human cytoplasmic protein. iVEC transplantation significantly recovered hind limb rotation angle as compared to human iPSC or rat meningeal cell transplantation when evaluated by the footprint test. Fourteen days after iVEC transplantation, the infarct area remarkably decreased as compared to that just before the transplantation when evaluated by magnetic resonance imaging or luxol fast blue (LFB) staining, and remyelination was promoted dramatically in the infarct when assessed by LFB staining. Transplantation of iVECs increased the number of oligodendrocyte lineage cells and suppressed the inflammatory response and reactive astrocytogenesis. These results suggest that iVEC transplantation may prove useful in treatment for white matter infarct ¹⁾.

¹⁾

Xu B, Kurachi M, Shimauchi-Ohtaki H, Yoshimoto Y, Ishizaki Y. Transplantation of iPS-derived vascular endothelial cells improves white matter ischemic damage. J Neurochem. 2019 Dec 28:e14949. doi: 10.1111/jnc.14949. [Epub ahead of print] PubMed PMID: 31883380.

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