THERAPEUTIC POTENTIAL OF ADIPOSE DERIVED STEM CELLS ON ALZHEIMER’S DISEASE

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Introduction: Alzheimer's disease (AD), one of neurodegenerative diseases, is characterized by accumulation of amyloid plaques and neurofibrillary tangles accompanied by memory deficits and cognitive dysfunction. Recent studies of stem cell show its therapeutic potential for neurodegenerative disorders by differentiating into other cell lineages and replacing damaged cells. Among stem cells, peripheral stem cells are readily accessible and autologous stem cell transplantation would have no immune rejection responses.

Aims: Here, we used human adipose-derived stem cells (hASCs) and examined whether intracerebrally or peripherally transplanted human ASCs could have therapeutic or preventive effects in AD mouse model (Tg2576).

Methods & results: hASCs were stereotaxically transplanted to hippocampus regions of Tg2576 mice. In addition, tail vein injection of hASCs was started at 3 months of age for 7 months. We performed the Morris water maze task at 14 months of age and we found that the memory impairment in Tg2576 mice was greatly improved by injection of hASC. One month later, animals were sacrificed to observe pathological changes. Congo red staining showed decreased number of plaques in cortex and hippocampus of hASC-injected Tg mice brains compared to those of Tg-sham mice.

Conclusions: These data strongly suggest that intracerebral or peripheral injection of hASCs significantly rescues memory deficit and neuropathology in the brain of Tg mice. Hence, hASCs have therapeutic potential for AD.