

Spermatogonia stem cells: A new pluripotent source for repair of demyelination defects

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Embryonic stem like cells (ES like cells) derived culturing of spermatogonia cells, which has self renewal and differentiation capacity to all three germ layers, make them as a new and unlimited source for cell therapy and repair of neurodegenerative diseases. In present study spermatogonia cells differentiated to oligodendrocyte like cells, were transplanted to demyelination model in rats and their role in remyelination was studied.

Spermatogonia cells were collected from neonatal mouse testis via a two-step enzymatic digestion. The spermatogonia cells were cultured in vitro and ES like cells colonies was appeared within 3 weeks. Real time PCR was performed to analyze the expression of pluripotency and spermatogonia specific genes. The pluripotency markers; SSEA1, SOX2 and Oct4 were evaluated as pluripotency markers using immunostaining and flowcytometry techniques. ES like cells were differentiated to neuroprogenitor cells and oligodendrocyte like cells and were transplanted to demyelination model rats. Cell integration and demyelination extension and intensity changes were evaluated using histological studies and immunocytochemistry.

The pluripotency characteristic of ES like cells were confirmed by expression of the pluripotency genes; Nanog and c-myc and pluripotency markers SSEA-1, SOX2 and Oct4. Investigation of Nestin, NF68, Olig2 and NG2 by immunocytochemical and real time PCR studies indicated the differentiation of ES like cells to neuroprogenitor and oligodendrocyte like cells. Histological findings showed a significant decrease in demyelination extension and a significant increase in myelination intensity in cell transplanted groups. Also differentiation of transplanted cells was confirmed to myelinogenic cells on the base of PLP expression.

ES like cells derived from spermatogonia cells can differentiated to neuroprogenitor and oligodendrocyte like cells that can form myelin after transplantation into the demyelination model in rat.

Biography

Maryam Nazm Bojnordi has completed her Ph.D. in Anatomical science at the age of 34 years from Tarbiat Modares University School of Medicine, Iran. She works as a scientific staff of medical university and fertility lab. She has published 4 papers in international journals and many presentation in international congresses and workshops. She has worked in Spermatogonia stem cells, cell differentiation, sperm freezing, IVF, IVM and has done some projects about these subjects.

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