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Abstract

BACKGROUND:

Schwann cells (SCs) can provide a suitable option for treatment not only diseases of peripheral nervous system (PNS), but also diseases of central nervous system (CNS). It is difficult to obtain sufficient large number of SCs for clinical purpose because of their restricted mitotic activity, and by sacrificing one or more functioning nerves with the consequence of loss of sensation. So, providing an alternative source for transplantation is desired. The aim of this study was isolation, characterization of human adipose derived stem cells (ADSCs), and transdifferentiation into Schwann-cells.

MATERIALS AND METHODS:

After isolation of ADSCs by mechanical and enzymatic digestion of adipose samples, characterization human ADSCs using flow cytometry was carried out. Human ADSCs were sequentially treated with various factors for neurosphere formation and terminal differentiation into Schwann-like cells. We used Schwann cell markers, GFAP and S100 to confirm the effectiveness of the differentiation of human ADSCs using Immunostaining and real time RT-PCR techniques.

RESULTS:

Flow cytometry analysis of ADSC showed isolated stem cells were positive for CD90 and CD44 markers of mesenchymal stem cells, but for CD45 and CD34 markers were negative. Dual immunofluorescence staining and real time RT-PCR analysis for GFAP and S100 markers were revealed that approximately 90\% of differentiated cells expressed co-markers.

CONCLUSION:

We indicated that human ADSCs have a suitable option to induce Schwann-like cells for autologous transplantation, offer promise for treatment in demyelinating diseases.

KEYWORDS:

Human ADSCs; S100; Schwann-like cell; transdifferentiation