Immunological Disorders and Immunotherapy

Gupte and Kaur, Immunol Disord Immunother 2016, 1:3

Editorial Open Access

Stem Cell Technology

Satish Gupte* **and Mandeep Kaur**

Department of Microbiology, Gian Sagar Medical College and Hospital, Rajpura, India

***Corresponding author:** Satish Gupte, Department of Microbiology, Gian Sagar Medical College and Hospital, Rajpura, India, Tel: 09915025865; E-mail: drsatishgupte@hotmail.com

Rec date: September 23, 2016, **Acc date:** September 26, 2016, **Pub date:** September 28, 2016

Editorial

Stem cells therapy used for treating a range of diseases that are not curable by current therapies is an innovative approach. Stem cells are undifferentiated cells that are found in adult's tissues and embryo. They are found in multicellular organisms and divide mitotically to self-renew and can differentiate into different types of cells in appropriate conditions for specific functions. For every organ and tissue in the body, stem cells are served as foundation [1]. There are many different types of stem cells that are formed at different times in our lives and come from different parts in the body. Embryonic stem cells and adult stem cells are two main types of cells that are found in body. Embryonic stem cells are formed from the inner cell mass of blastocysts, and adult stem cells are isolated from various tissues [2]. There are several different sources of stem cell such as embryonic stem cells, tissue-specific stem cells, mesenchymal stem cells, induced pluripotent stem cells, amnoitic stem cells.

There are various applications of stem cell therapy. The common autoimmune diseases such as Rheumatoid arthritis, systemic lupus erythematosis (SLE), multiple sclerosis, type 1 diabetes, Sjogren's syndrome and inflammatory bowel disease are treating by hematopoietic stem cell therapy. Hematopoietic stem cell therapy is aimed at destroying the mature, auto-reactive immune cells and generating a new functioning immune system. One scientist, Richard Burt et al. conducted a long-term follow-up (one to three years) of seven SLE patients who underwent hematopoietic stem cell therapy and the observations were astonishing. They found that patients, who had treated with stem cell therapy, remained free from active lupus and their condition improved continuously after transplantation, without any immunosuppressive drugs [3]. In Rheumatoid arthritis, chondrocytes cells that build cartilage in joints, may be helpful in stem cell therapy. These stromal cells have been isolated from human bone marrow [4].

Stem cell therapy is also under investigation for treatment in recent times. HIV-resistant lymphoid and myeloid system in experimental mice model is reconstitute to combat HIV infections in humans [5]. The CCR5 receptors which are utilized by HIV for their entry are disrupt by engineered human hematopoietic cells. When these engineered cells are transplanted to mice, they confer resistance towards the HIV infections. In a HIV patient, when CCR5 disrupted stem cells were transplanted, the patient remained free of virus for 20 months even in absence of antiretroviral therapies [6]. Neurological disorders such as Alzheimer's disease, Parkinson's disease, stroke, multiple sclerosis are also treated by stem cell therapy. Stem cell therapy in overall involves the local delivery of stem cells to infected site or their systemic transfusion. So in this way, due to the ability to renew, stem cell therapy used for the treatment of many infectious and non- infectious diseases [7].

References

1. Rai RC, Bhattacharya D, Das G (20121) Stem Cells in Infectious Diseases, Immunology Group, International Centre for Genetic Engineering and Biotechnology, New Delhi, India. 20: 416-426.
2. Becker AJ, McCulloch EA, Till JE (1963) Cytological demonstration of the clonal nature of spleen colonies derived from transplanted mouse marrow cells. Nature 197: 452-454.
3. Traynor AE, Schroeder J, Rosa RM, Cheng D, Stefka J, et al. (2000) Treatment of severe systemic lupus erythematosus with high-dose chemotherapy and haemopoietic stem-cell transplantation: a phase I study. Lancet 356: 701-707.
4. Pittenger MF, Mackay AM, Beck SC, Jaiswal RK, Douglas R, et al. (1999) Multilineage potential of adult human mesenchymal stem cells. Science 284: 143-147.
5. Holt N, Wang J, Kim K, Friedman G, Wang X, et al. (2010) Human hematopoietic stem/ progenitor cells modified by zink-finger nucleases targeted to CCR5 control HIV-1 in vivo. Nature Biotechnol 28: 839-847.
6. Hütter G, Nowak D, Mossner M, Ganepola S, Müssig A, et al. (2009) Long-term control of HIV by CCR5 Delta32/Delta32 stem-cell transplantation. N Engl J Med 360: 692-698.
7. Barry FP, Murphy JM (2004) Mesenchymal stem cells: clinical applications and biological characterization. Int J Biochem Cell Biol 36: 568-584.