Stem Cell Technology
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Editorial

Stem cell 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, amnionotic stem cells.

There are various applications of stem cell therapy. The common autoimmune diseases such as Rheumatoid arthritis, systemic lupus erythematosus (SLE), multiple sclerosis, type 1 diabetes, Sjögren’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 transfection. 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

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