Menstrual Blood Stem Cell Preservation

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Abstract

Unlike past days menstrual blood has been considered as the rich source of self-rejuvenating stem cells. These cells can multiple rapidly and helps in various cosmetic and regenerative surgeries. They can easily be used same as that of stem cells derived from umbilical cord and bone marrow.

Key Words: *Menstrual Blood Banking, Stem cell, Regenerative capacity.*

Introduction

Menstrual blood stem cell banking has been established as an important field of research and is progressing day by day. Earlier menstrual blood was considered as unsanitary waste of human body but latest researches have shown that menstrual blood is rich in stem cells and they have the ability to multiple and differentiate into any kind of cells.(123)Over the years menstrual stem cells are used in various regenerative and cosmetic surgeries.

Stem cells derived from menstrual blood are rich in mesenchymal stem cells. These cells have high survival rate after transplant as they are immunologically immature and can successfully contribute in cell cycle. Menstrual stem cells have same regenerative capacity as that of umbilical cord blood and bone marrow. They are considered as powerful tools for repairing as they can multiply rapidly and can differentiate into many other types of cells such as cardiac, neural, bone, fat and cartilage. They can easily be collected non-invasively without ethical concerns.

Sources of stem cells:

There are two main sources of stem cells are embryonic stem cell and adult stem cells. Embryonic stem cells can be collected from human embryos whereas adult stem cells can be derived from bone marrow, umbilical cord, menstrual blood cells, placental tissue, endometrium, peripheral blood stem cells.[4] Adult cells found in bone marrow collected through invasive painful procedure.[5]

Collection and storage:

Menstrual blood cell collection procedure is hassle free and can be done easily at home.It can be collected by using a medical-grade silicone cup instead of a sanitary pad or tampon. On the heaviest flow day, a silicone cup is inserted into the vagina for collecting 20 millilitres of blood. 15 ml to 20 ml of menstrual blood could easily yield between 10 million to 100 million Mesenchymal Stem cells. After that collected blood is poured into collection kit and sent to menstrual blood bank laboratory where it is processed, frozen and stored. It is completely painless and non-invasive procedure. The menstrual stem cells are cryogenically preserved in overwrapped vials which is closely monitored all the times for its safety and future usage.[6]

Advantages:

· Easily accessible, non-invasive and painless procedure.

· Highly potential to replicate into bone, skeletal, cartilage muscle cells

· More proliferative and multiply for longer duration without damaging DNA.

· Can be administered easily through a standard IV line.

· It can be preserved multiple times at any age.

Uses:

Menstrual stem cells are used in Heart Failure & Post Myocardial Infarction as they helps to secrete certain angiogeneic and trophic factors that assist in activation and regeneration of cardiac stem cells.[7] They can also be used in treatment of stroke as these cells migrate to the infarct site and secrete neurotrophic factors.[8] They are also beneficial in several other conditions like atherosclerosis, Diabetes, Rheumatoid arthritis, Parkinson's disease and Alzheimer's disease etc. As the chances of immune rejection are minimal as female patients are using their own cells hence it has broad scope in the near future.

Menstrual blood stem cell banks:

In India, stem cell banking services are mainly provide by Privately- held banks, Government- owned (Public) banks and Community stem cell bank. Life cell international Pvt. Ltd. is the first community stem cell bank in India. It has two high-tech labs located at Chennai (Tamil Nadu) and Gurugram (Haryana). It has dual storage facility.

Conclusion: Menstrual derived stem cells have shown regenerative properties in prevention and control of various disorders like stroke, diabetes, Myocardial infarction and many other neuro degenerative diseases. Diverse therapeutic research on mesenchymal stem cells would greatly contribute to treat variety of diseases.In summary, more clinical research on menstrual derived stem cells preservation and its clinical use can make these cells a preferred type of stem cells over umbilical cord and bone marrow stem cells.

Discussion

Stem cells are used to treat variety of diseases and disorders. Menstrual derived stem cells are considered to have tremendous therapeutic potential. Naoko Hida et al (2008) stated that menstrual derived mesenchymal stem cells have potential to restore impaired. cardiac functioning[9]. Ian A White et al (2016) have also stated Mesenchymal stem cells are capable of differentiation into cardiac cells[7]. In another study Borlongan et al. concluded that menstrual derived stem cells successfully improved ischemic stroke among rats in vitro[10].

Ethical Clearance- Not applicable

Source of Funding- Self

Conflict of Interest - Nil

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