Menstrual blood banking

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Abstract

A new research has found that menstrual blood is a rich source of stem cells that have the ability to multiply and differentiate into any kind of cells. Stem cells in menstrual blood have similar regenerative capabilities as the stem cell in umbilical cord blood and bone marrow.

Keywords: Menstrual blood, Stem cells, Regenerative capabilities, Stem cell bank, Menstrual blood banking.

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Introduction

Till date women have been discarding menstrual blood as an unwanted and unsanitary waste. However, a new research has found that menstrual blood is a rich source of stem cells that have the ability to multiply and differentiate into any kind of cells. The discovery of stem cells in the menstrual blood has given a new meaning to menstruation for women who earlier considered menstruation as nothing but a painful and necessary evil. Stem cells have the unique quality of differentiating into any type of cell[1-3]. As these cells are immunologically immature in nature, they are able to contribute successfully in the cell survival after a transplant. Stem cells in menstrual blood have similar regenerative capabilities as the stem cells in umbilical cord blood and bone marrow. Cryo-Cell's patent-pending menstrual stem cell service offers women in their reproductive years the ability to store and preserve these cells for potential use by herself or a family member free from ethical or political controversy. Cryo-Cell is the only stem cell bank in the world that can offer women the reassurance and peace of mind that comes with the opportunity[4-6].

What are menstrual stem cells?

Stem cells in menstrual blood are highly proliferative and possess the unique ability to develop into various other types of healthy cells. During a woman's menstrual cycle, these valuable stem cells are discarded.

Cryo-cell's menstrual stem cell banking service captures those self-renewing stem cells, processes and cryopreserves them for emerging cellular therapies that hold the promise of potentially life threatening disease[7].

How are menstrual stem cells collected, processed and stored?

The menstrual blood is collected in a physician's office using a medical-grade silicone cup in place of a tampon or sanitary napkin. The sample is shipped to Cryo-Cell via a medical courier and processed in our state-of-the-art ISO Class 7 clean room.

The process for collection of menstrual blood is simple; like tampon, a silicone cup is inserted in the vagina on the day of heaviest flow. The cup needs to be placed inside the vagina for at least three hours so as to collect approximately 20 milliliters of blood. This is then poured in the collection kit and is sent back to the menstrual blood bank laboratory where it is processed, frozen and stored. What makes this method user friendly is that it is completely painless and non-invasive. Also, any woman who wants to preserve stem cells for future can do so without having to wait for delivery of baby[7-8].

The menstrual stem cells are stored in two cry ovials that are overwrapped to safeguard them during storage. The overwrapped vials are cryogenically preserved in a facility that is closely monitored at all times to ensure that your menstrual stem cells are safe and ready for future use.

Advantages of Menstrual Blood Stem Cells

- Higher Potential compared to similar cells from the bone marrow, and hence can potentially be used across a wider range of applications.
- Higher proliferative properties compared to similar cells from bone marrow. Allows them to multiply for longer duration without damages to DNA and hence larger numbers can be obtained on expansion from small initial numbers.
- Multiple Dosages are possible by obtaining unlimited numbers of purified mesenchymal stem cells for therapeutic use for more than once.
- Painless and harmless procedure allowing simple, easy & convenient collection of menstrual blood.
- High Patient safety since these cells are well tolerated, with no patient deaths, no toxicity or any

adverse side effects reported thus holding the potential for a large-scale clinical use[4-6].

Review of Literature

Researchers mention that "Stem cells can be obtained from women's menstrual blood derived from the endometrium. The cells display stem cell markers such as Oct-4, SSEA-4, Nanog, and c-kit (CD117), and have the potent ability to differentiate into various cell types, including the heart, nerve, bone, cartilage, and fat. There has been no evidence of teratoma, ectopic formation, or any immune response after transplantation into an animal model. These cells quickly regenerate after menstruation and secrete many growth factors to display recurrent angiogenesis. The plasticity and safety of the acquired cells have been demonstrated in many studies. Menstrual blood-derived stem cells (MenSCs) provide an alternative source of adult stem cells for research and application in regenerative medicine. We summarize the multi-potent properties and the plasticities of MenSCs and other endometrial stem cells from recent studies conducted both in vitro and in vivo".

Menstrual blood contains millions of stem cells that have many properties and characteristics similar to those of stem cells found in bone marrow and embryos. These stem cells exhibit capabilities for self-renewal and multi-potency. A company in Los Angeles developing medical treatments based on stem cells, called the discovery "exciting," saying the menstrual stem cells appear to have several advantages over other types of adult stem cells. "For starters, they're easy to obtain". "And since, they're the patient's own cells, don't need to worry about immune rejection, a major problem associated with the use of embryonic stem cells". The lack of immune rejection could extend beyond women from whom the cells were initially derived. The menstrual stem cells seem to have an immune system-suppressing effect that could enable them to be transplanted into other people without rejection. Menstrual stem cell can be used for treating several ailments - chronic obstructive pulmonary disease, osteoarthritis, multiple-sclerosis, cardiac disease, Type 1 diabetes, Parkinson's disease, spinal cord injury, acute lung injury and renal failure. The menstrual blood is a valuable resource of stem cells. By preserving your own menstrual blood stem cells, you can secure your life against such future ailments."

Scope and Future

Menstrual Blood Banking has a wide scope as the need for regenerative therapies incorporating cells that can engraft and differentiate is vast. Though Menstrual Stem Cell technology is yet to be utilized in human treatments and therapies, the research has established the beneficial properties of these cells and their potential use in treatment of several medical conditions like atherosclerosis, diabetes, stroke, rheumatoid arthritis, Parkinson disease, Alzheimer's disease and many more. Alongside, menstrual blood can overcome the problem of immune rejection during the transplant, allowing the female patients to use their own stem cells for the treatment. Thus, it can be said that Menstrual Blood Banking has a vast scope in future and is the next big thing in the medical world[3-5].

Menstrual Blood Stem Cell Banks

Life Cell is the main network of menstrual blood banking, headquartered in Chennai, India, and has over 100 branches spread across 21 states in the country. The stem cell storage facilities are located in Chennai and Gurgaon.

Chennai: The flagship facility at Chennai is home to one of the world's largest stem cells processing and preservation centers with over 65,000 sq ft of operating area and spread over a 3-acre campus.

Gurgaon: The newest facility with 65,000 sq ft of built-up area is presently serving as a back-up storage facility and being expanded to include testing and processing divisions. This facility is located at IMT Manesar and is about 30km from the Delhi International Airport.

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