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MENSTRUAL BLOOD BANKING: INNOVATIVE BEST FROM WASTE

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Abstract: 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. Menstrual blood contains mesenchymal stem cells (MenSC), considered a potential "off-the-shelf" treatment for a range of diseases and medical conditions. Menstrual Blood Banking appears to be an innovative, promising, cost effective, novel and ethically acceptable alternative concept which needs to be popularized in the field of medicine.

Index Terms **– Menstrual blood banking.**

MENSTRUAL CYCLE:

The menstrual cycle is the regular natural change that occurs in the female reproductive system (specifically the uterus and ovaries) that makes pregnancy possible. The cycle is required for the production of oocytes, and for the preparation of the uterus for pregnancy. The menstrual cycle occurs due to the rise and fall of estrogen. This cycle results in the thickening of the lining of the uterus, and the growth of an egg, (which is required for pregnancy). The egg is released from an ovary around day fourteen in the cycle; the thickened lining of the uterus provides nutrients to an embryo after implantation. If pregnancy does not occur, the lining is released in what is known as menstruation.[1]

PHASES OF MENSTRUAL CYCLE:

The day count for menstrual cycle begins on the first day of menstruation when blood starts to come out of the vagina. In this section, the length of menstrual cycle has been assumed to be 28 days (which is the average among women). The entire duration of a Menstrual cycle can be divided into four main phases:[2]

1. Menstrual phase (From day 1 to 5)
2. Follicular phase (From day 1 to 13)
3. Ovulation phase (Day 14)
4. Luteal phase (From day 15 to 28)

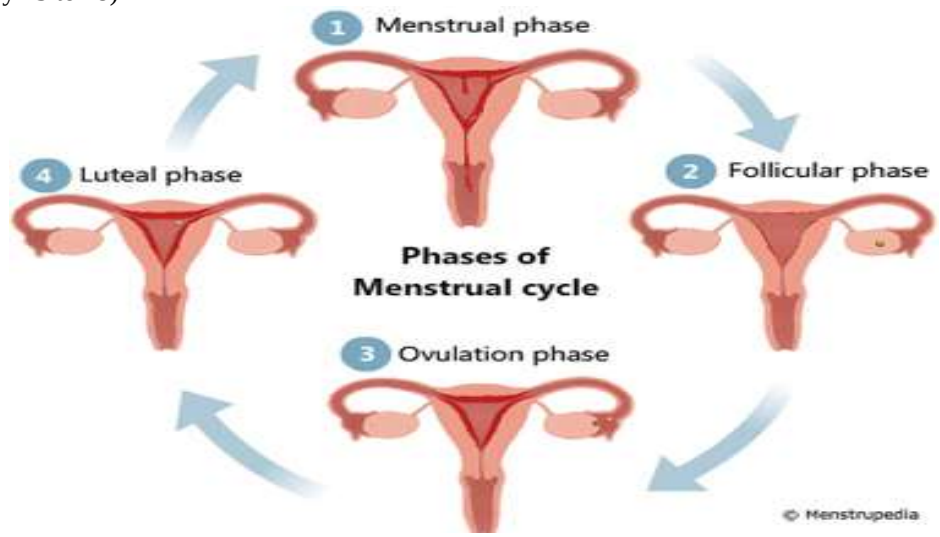

Fig1. Phases Of Menstrual Cycle

CONTENTS AND IMPORTANCE OF MENSTRUAL BLOOD:

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. Earlier, blood from umbilical cord was regarded as the ultimate reserve for stem cells. Only those who have given birth at anytime of their life were able to preserve the stem cells as they were obtained from umbilical cord. But researchers have now discovered and successfully harvested stem cells from menstrual blood making it possible for all the women including those who have never given birth to preserve stem cells for themselves. 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. As these cells are immunologically immature in nature, they are able to contribute successfully in the cell survival after a transplant. [3]

The primitive cells also known as the stem cells are miraculous cells that can regenerate into various organs such as the heart, bones, muscles and nervous system. The emergence of stem cell technology and the successful impact of the stem cells research has brought ray of hope to the diseased population of the world. Remarkable responses have been created in the medical specialties by stem cell therapies with the most popularized concept of cord blood which has helped in many major diseases like Thalassemia, Alzheimer's disease. Likewise stromal cells of menstrual origin or Menses-Menstrual Blood is Derived Stem Cells have demonstrated cells to be equally multi potent like the umbilical cord blood and the dental pulp stem cells except for the myth among the public that the menstrual blood is a bad blood that needs to be discarded. [4]

Menstrual stem cells could offer a lot of advantages over the other stem cells as the source is easy to find because every woman is a source, quantity available is more, the fear of tissue rejection is minimal and above all the question of ethical issues related to using embryonic stem cells are avoided. Researchers across the globe have come to a conclusion that the cells derived from menstrual blood may represent a potentially unlimited, easily available and cost effective source used in regenerative therapies. Menstrual Blood Banking appears to be an innovative, promising, cost effective, novel and ethically acceptable alternative concept which needs to be popularized in the field of medicine.[4]

Menstrual blood contains mesenchymal stem cells (MenSC), considered a potential "off-the-shelf" treatment for a range of diseases and medical conditions. Samples of menstrual blood can be collected painlessly, inexpensively, and as frequently as every month for cell therapy. While there has been considerable previous research into the clinical advantages of MenSC, there is currently little understanding of potential donors' attitudes regarding menstrual blood donation and MenSC.[5]

Currently, people are increasingly interested in MenSC's clinical potential due to their high proliferation, remarkable versatility, and periodic acquisition in a non-invasive manner with no other sources of MSCs that are comparable in adult tissue. In this review, the plasticity of pluripotent biological characteristics, immunophenotype and function, differentiative potential, and immunomodulatory properties are assessed. Furthermore, also summarize their therapeutic effects and functional characteristics in various diseases, including liver disease, diabetes, stroke, Duchenne muscular dystrophy, ovarian-related disease, myocardial infarction, Asherman syndrome, Alzheimer's disease, acute lung injury, cutaneous wound, endometriosis, and neurodegenerative diseases. Subsequently, the clinical potential of MenSCs is investigated.[6]

Survey was conducted by Manley H., Sprinks J., Breedon P. among One hundred women 18 years of age to understand attitudes and potential barriers to menstrual blood donation. The questionnaire assessed participant age and brief medical history (giving birth, donating blood, donating stem cells), menstrual experience (period rating, preferred menstrual hygiene products), and whether participants would donate MenSC or accept MenSC therapy. MenSC was met with a generally positive response, with 78% of menstruating women willing to donate menstrual blood. No significant relationship was recognized between willingness to donate menstrual blood with age, history of childbirth or blood donation, menstruation perception, and preferred menstrual hygiene product. Women rated their period experience better after being made aware of the ability to donate menstrual blood, meaning MenSC therapy can be beneficial for donors as well as patients. Considering women's attitudes to MenSC and donation of menstrual blood, the future of MenSC therapy is positive; women are generally willing to donate menstrual blood, independent of age, perception of periods, and history of childbirth and blood donation.[5]

HOW TO DONATE MENSTRUAL BLOOD FOR STEM CELL:

Currently, one company has the market cornered in the collection and storage of menstrual blood for stem cells. The company is called C'Elle. Collecting and storing your menstrual blood for its stem cells is easy.

Instructions: Things you'll need is Collection package

Steps for collection of menstrual blood:

1. Order your collection kit from C'Elle through their company website (see Resources).
2. Freeze the cooling packs that arrive with your C'Elle collection kit immediately upon arrival and continuously until you are ready to package your collections and send them back via FedEx.
3. To collect your menstrual blood, insert the provided menstrual cup in place of a tampon. This cup needs to be left in for three hours to collect your first of two specimens.
4. Take the menstrual cup out. It should have about a teaspoon of fluid in it. Carefully place this fluid into the provided vials of solution.
5. Refrigerate your first specimen while you collect your second.
6. Replace your menstrual cup for another three hours and repeat the collection process for your second vial. One vial will be used for storage and the other will be used for infectious disease testing.
7. Remove your cooling packs from the freezer; the first specimen from the refrigerator and package both specimens and the cooling packs in your original collection kit box after you have collected both specimens.
8. Ship your collection kit back to C'Elle using the provided airbilled FedEx box.

REFERENCES:

1. Menstrual cycle. https://en.wikipedia.org/wiki/Menstrual_cycle
2. Phases of Menstrual cycle. https://menstrupedia.com/
3. Neha Verma. Menstrual Blood banking: Scope and Future. https://www.medindia.net/news/healthinfocus
4. Mathew A., Francis F., Joel SE. Menstrual Blood Banking: A concept is best out of waste in the area of stem cell research. JOURNAL OF MEDICAL BIOMEDICAL AND APPLIED SCIENCES. 2016;2(3): https://www.jmbas.in/index.php/jmbas/article/view/11
5. Mathew A., Francis F., Joel SE. Menstrual Blood-Derived Mesenchymal Stem Cells: Women's Attitudes, Willingness, and Barriers to Donation of Menstrual Blood. WOMENS HEALTH. 2019;28(12): https://www.ncbi.nlm.nih.gov/pubmed/31397634
6. Chen L., Qu J., Xiang C. The multi-functional roles of menstrual blood-derived stem cells in regenerative medicine. Stem cell Research & Therapy. 2019;10(1): https://stemcellres.biomedcentral.com
7. MENSTRUAL BLOOD STEM CELL BANKING IN INDIA. https://repairstemcell.wordpress.com