

6. Cord Blood Banking

Prelims Syllabus: Medicine and Pharmaceuticals

Mains Syllabus: GS- III Science and Technology - developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

Context:

- Cord Blood Banking is recently seen in news.

Highlights

- Over the past decade, stem cell banking has been aggressively marketed even as its use is still in experimental stages.
- They get access to data of to-be parents and start approaching their prospective customers much before the delivery and offer competitive packages.
- They convince parents to bank the cells for several years promising future therapeutic use.
- Enormous fees are charged from parents to preserve cells merely by emotional marketing.
- According to **Indian Council of Medical Research (ICMR)**, there is no scientific basis for preservation of cord blood for future self-use and this practice therefore raises ethical and social concerns. It does not recommend commercial stem cell banking.
- Private storage is advisable when there is an elder child in the family with a condition treatable with these cells and the mother is expecting the next baby. In other situations, parents should be educated about the limitations of banking at this point of time.

About Indian Council of Medical Research:

- It is the apex body in India for formulation, coordination and promotion of biomedical research.
- Its mandate is to conduct, coordinate and implement medical research for the benefit of the Society; translating medical innovations into products/processes and introducing them into the public health system.
- It is funded by the Government of India through the Department of Health Research, Ministry of Health & Family Welfare.

Cord Blood Banking:

- It is the blood from the baby that is left in the umbilical cord and placenta after birth.
- The banking involves taking the umbilical cord blood, which is a rich source of stem cells, and preserving it for future use.

- It contains special cells called **hematopoietic stem cells** that can be used to treat some types of diseases. **Hematopoietic** stem cells can mature into different types of blood cells in the body.
- Globally, the banking is recommended as a **source of hematopoietic stem cell** derived from bone marrow, peripheral blood, or umbilical cord blood transplantation for haematological cancers and disorders where its use is recommended.
- The use of cord blood as a source of stem cells for all other conditions is **not** yet established.

Stem Cells:

- It is special human cells that have the ability to develop into many different cell types, from muscle cells to brain cells.
- It is divided into two main forms- Embryonic stem cells and Adult Stem Cells.
- **Embryonic stem cells** come from unused embryos resulting from an in vitro fertilization procedure and that are donated to science. These cells are pluripotent, meaning that they can turn into more than one type of cell.
- **Adult Stem Cells** are two types of adult stem cells. **One type** comes from fully developed tissues, like the brain, skin, and bone marrow. There are only small numbers of stem cells in these tissues, and they are more likely to generate only certain types of cells. For example, a stem cell derived from the liver will only generate more liver cells.
- The second type is induced **pluripotent stem cells**. These are adult stem cells that have been manipulated in a laboratory to take on the pluripotent characteristics of embryonic stem cells.