Science & Technology · GS - III

Stem cell therapy is gaining popularity in India to treat a wide variety of medical conditions including leukaemia, Thallessemia, damaged sornea and several burns. Describe briefly what stem cell therapy is and what advantages it has over other treatments?

EXAM YEAR	PAPER	SUBJECT
2017	GS - III	Science & Technology

MARKS	WORD LIMIT
10	~150 words

Answer Hint

Stem cell differentiation; tissue repair; haematopoietic transplantation; regenerative medicine; personalised treatment; ethical oversight

Model Answer

Introduction

Stem cell therapy uses stem cells, which can self-renew and develop into specialised cell types, to replace damaged cells or restore biological functions. Its clinical value depends on the disease and the type of stem cell used.

What Is Stem Cell Therapy?

- Stem cells may be obtained from bone marrow, peripheral blood, umbilical cord blood or other sources.
- Haematopoietic stem cell transplantation is an established treatment for selected blood disorders, including certain leukaemias and thalassaemias.
- Other regenerative applications are being researched, but many remain experimental.

Advantages Over Some Conventional Treatments

- **Cell replacement:** It can restore blood-forming cells destroyed by disease or intensive treatment.
- **Potential tissue repair:** Research explores whether stem cells or their products can help repair damaged tissues.
- **Targeted treatment:** Certain transplants address the underlying cellular defect rather than only controlling symptoms.
- **Research potential:** Stem cells support disease modelling and the testing of new treatments.
- **Reduced dependence on repeated interventions:** In suitable conditions, successful transplantation may provide long-term disease control.

Limitations and Safeguards

Stem cell treatments can involve infection, immune rejection, graft-versus-host disease and other serious complications. Many advertised applications lack strong clinical evidence. Ethical sourcing, scientific validation and regulation are essential.

Conclusion

Stem cell therapy offers established benefits in selected blood disorders and promising possibilities in regenerative medicine. It should be used only for evidence-supported indications under qualified medical supervision.

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