2. Curing HIV Using Stem Cell Therapy

Prelims Syllabus: Science & Technology - Biotechnology

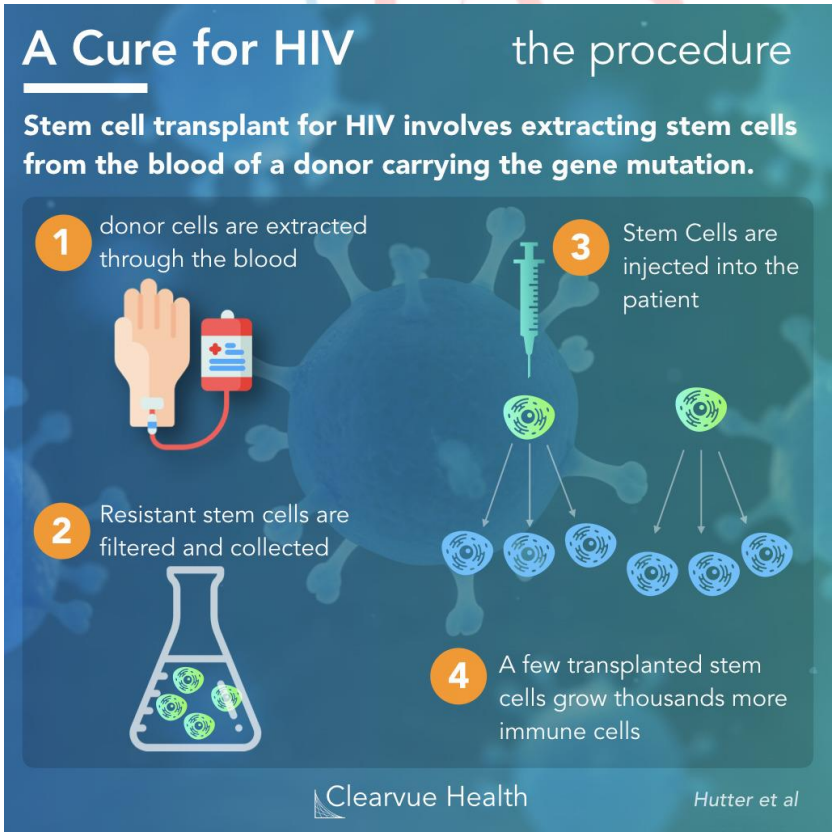
Mains Syllabus: GS-III Awareness in the fields of IT, Space, Computers, Robotics, Nano-Technology, Bio-Technology and Issues Relating to Intellectual Property Rights.

Why in News?

- Researchers report that a patient who underwent stem-cell transplantation and a chemotherapy drug regimen has been cured of HIV.

Highlights:

- In 2011, a patient based in Berlin (the 'Berlin patient') was the first HIV patient to be reportedly cured of the virus three and half years after undergoing similar treatment.
- Although there was no active viral infection in the patient's body, remnants of integrated HIV-1 DNA remained in tissue samples, which were also found in the first patient to be cured of HIV.
- The authors suggest that these can be regarded as so-called 'fossils', as they are unlikely to be capable of reproducing the virus. The findings show that the success of stem cell transplantation as a cure for HIV, first reported nine years ago in the Berlin patient, can be replicated.



- As a high-risk treatment, this therapy is unlikely to be offered widely to patients with HIV who are on successful antiretroviral treatment.
- The transplant aimed to make the virus unable to replicate in the patient's body, whilst the body irradiation and chemotherapy targeted any residual HIV virus.
- Ultrasensitive viral load sampling from the London patient's cerebrospinal fluid, intestinal tissue or lymphoid tissue was taken at 29 months after interruption of antiretroviral therapy (ART) and viral load sampling of his blood at 30 months.
- The results showed no active viral infection was detected in samples of the patient's blood at 30 months or in his cerebrospinal fluid, semen, intestinal tissue and lymphoid tissue 29 months after stopping ART.
- Researchers suggest that the long-term remission of HIV can be achieved using reduced intensity drug regimens, with one stem cell transplant (rather than two) and without total body irradiation.
- Gene editing using the CCR5 has received a lot of attention recently. There are still many ethical and technical barriers to overcome before any approach using CCR5 gene editing can be considered as a scalable cure strategy for HIV.