



HIV and stem cell transplant

 sanskritias.com/current-affairs/hiv-and-sstem-cell-transplant



(Mains GS 3 : Science and Technology- Developments and their Applications and Effects in Everyday Life.)

Context:

Recently, a U.S. patient with leukemia has become the first woman and the third person to date to be cured of HIV after receiving a stem cell transplant from a donor who was naturally resistant to the virus that causes AIDS.

India's HIV Estimation:

- As per the India HIV Estimation 2019 report, the estimated adult (15 to 49 years) HIV prevalence trend has been declining in India since the epidemic's peak in the year 2000 and has been stabilising in recent years.
- In 2019, HIV prevalence among adult males (15–49 years) was estimated at 0.24% and among adult females at 0.20% of the population.
- There were 23.48 lakh Indians living with HIV in 2019. Maharashtra had the maximum at 3.96 lakh followed by Andhra Pradesh (3.14 lakh) and Karnataka.

About the treatment

- Recently, at a Conference on Retroviruses and Opportunistic Infections, Colorado, United States. researchers described the case of a 60-year-old African American woman who was diagnosed with an HIV infection in 2013.
- She was started on the standard HIV treatment regimen of anti-retroviral treatment (ART) therapy consisting of tenofovir, emtricitabine and raltegravir.

- She was also later diagnosed with leukemia in 2017 and in that year she received cord blood, or embryonic stem cells, from a donor with a rare mutation that naturally blocks the HIV virus from infecting cells.
- She was also given blood stem cells, or adult stem cells, from a relative. The adult stem cells boosted the patient's immunity and possibly helped the cord blood cells fully integrate with the lady's immune system.

Unique about the recovery:

- Only two people have reportedly been cured of HIV so far and both have relied on bone marrow transplants from donors who carried the mutation, called CCR5 delta 32, that naturally makes one immune to an HIV infection and AIDS.
- Both prior cases are of men who received bone marrow transplants from donors who carried a mutation that blocks HIV infection.
- However, the previous transplants involved adult stem cells and these cells from the bone marrow replaced their immune system.
- The body's natural tendency is to reject foreign stem cells and so both donors suffered side effects such as graft versus host disease where the donor's cells attack the recipient's body.
- Both men developed severe illnesses throughout their HIV remission but in contrast the woman was discharged from hospital within 17 days of the transplant and did not develop graft versus host disease.
- Her doctors theorise that it was a combination of the embryonic and adult stem cells that led to a better health outcome.

Still elusive:

- While this approach is certainly a welcome addition to the arsenal of treatments, stem cell therapy is a cumbersome exercise and barely accessible to most HIV patients in the world.
- Moreover, this requires stem cells from that rare group of individuals with the beneficial mutation.
- Anti-retroviral therapy, through the years, has now ensured that HIV/AIDS isn't always a death sentence and many with access to proper treatment have lifespans comparable to those without HIV.
- A vaccine for HIV or a drug that eliminates the virus is still elusive and would be the long sought 'cure' for HIV/AIDS.

Conclusion:

Taken together, these three cases of a cure post stem cell transplant all help in teasing out the various components of the transplant that were absolutely key to a cure

