# CCR5 mutation

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**In news–** A 53-year-old man from Germany, referred to as the Dusseldorf patient, has become at least the third person to have been "cured of HIV" with bone-marrow transplant from people carrying a specific HIV-resistant genetic mutation.

## What is CCR5 mutation and how does it fight off HIV?

- **HIV** (Human Immunodeficiency Virus) **mainly attacks the CD4 immune cells in the human body,** thereby reducing a person's ability to fight off secondary infections.
- **The CCR5 receptors on the surface of the CD4 immune cells** act as a doorway for the HIV virus.
- However, the CCR5-delta 32 mutation prevents these receptors used by the HIV virus from forming on the surface, effectively removing the doorway.
- Only 1 per cent of the people in the world carry two copies of the CCR5-delta 32 mutation – meaning they got it from both their parents – and another 20 per cent carry one copy of the mutation, mainly those of European descent.
- Those with the mutation hence are almost immune to the infection, although some cases have been reported.

## Can such transplants solve the HIV crisis-

- With the mutation existing in very few people and nearly 38.4 million people living with HIV across the world, it would be very difficult to find a matching donor in the first place.
- Add to that the fact that the **mutation occurs mainly among Caucasians,** and the donor pool shrinks further for many, especially those from countries with high HIV burden.
- However, even if donors were to become available, **experts believe it is highly unlikely that bone marrow**

**transplants can be rolled out for all those with HIV**.

- This is because it is a major procedure with high risks associated, especially that of the person rejecting the donated marrow.
- There is also the likelihood of the virus mutating to enter the cells through other mechanisms in such persons.

**The current treatments for HIV-**

- Although there are no cures for the infection at present, the **disease can be managed using antiretroviral therapy.**
- **These medicines suppress the replication of the virus within the body**, allowing the number of CD4 immune cells to bounce back.
- Although earlier the drugs were given only to those with low CD4 count under the government's programme, now the programme supports anyone who has been diagnosed with HIV.

- **The drugs have to be taken for life because the virus continues to persist in reservoirs across the body.**

- If the drugs are stopped, the virus can again start replicating and spreading. When the viral levels are low, the likelihood of a person transmitting the infection is also low.
- If left untreated, the virus destroys a person's immune system and they are said to be in the Acquired Immunodeficiency Syndrome stage (AIDS) where they get several opportunistic infections that may result in death.
- **Although there is no vaccine for HIV, there are Pre-exposure prophylaxis (or PrEP) medicines t**hat can be taken by people at high risk of contracting the infection.
- PrEP reduces the risk of getting HIV from sex by about

99 percent.

**Further reading: https://journalsofindia.com/woman-cured-of-hiv-after-stem-cell-transplant/**