Convalescent Plasma Therapy and COVID-19

Part of: GS Prelims and GS-III- S&T

- **Basis of the Therapy:**
  - The convalescent plasma therapy seeks to make **use of the antibodies developed in the recovered patient** against the coronavirus.
  - The **whole blood or plasma** from such people is taken, and the plasma is then injected in critically ill patients so that the **antibodies are transferred** and boost their fight against the virus.

- **Time Period for Infusion:**
  - A study in The Lancet Infectious Diseases stated that a COVID-19 patient usually **develops primary immunity against the virus in 10-14 days**.
  - Therefore, if the plasma is **injected at an early stage**, it can possibly help fight the virus and prevent severe illness.

- **Infusion into COVID-19 Patients:**
  - The plasma can be infused into two kinds of COVID-19 patients—those with a **severe illness**, or individuals at a **higher risk of getting the virus**.
  - However, while plasma transfers immunity from one person to another, it is **not known if it can save lives** in COVID-19 infection.
  - The treatment could be **effective for patients in the age group 40-60**, but may be **less effective for people aged beyond 60 years**.

- **Previous Application of the Convalescent Plasma Therapy:**
  - The **United States** used plasma of recovered patients to treat patients of **Spanish flu** (1918-1920).
  - **Hong Kong** used it to treat **SARS (Severe Acute Respiratory Syndrome)** patients in 2005.
  - In **2009**, the **swine flu (H1N1)** patients were treated with plasma.
    - A study in Oxford University’s journal Clinical Infectious Diseases found that “convalescent plasma reduced respiratory tract viral load, serum cytokine response, and mortality” in H1N1 patients.

- **WHO Guidelines (2014):**
  - WHO guidelines in 2014 mandate a **donor’s permission before extracting plasma**.
  - Plasma from **only recovered patients must be taken**, and donation must be done from people not infected with HIV, hepatitis, syphilis, or any infectious disease.
  - If whole blood is collected, the plasma is separated by sedimentation or centrifugation, then injected in the patient.
  - If plasma needs to be collected again from the same person, it must be done after 12 weeks of the first donation for males and 16 weeks for females.

- **Application in India:**
  - Currently, India **has facilities for removing 500 ml of plasma** from a donor.
  - For this experimental therapy, the Drug Controller General of India will first have to grant blood banks approval for removal of plasma from recovered COVID-19 patients.
  - In India, the **special care of the risk of infection during transfusion** needs to be taken care of.

Relapse in Patients Recovered from COVID-19
Patients who test positive for COVID-19 develop protective antibodies. Theoretically, there can be a relapse even in patients who have antibodies. There are various reasons for such relapsing of COVID-19, some of them are:

- **Mutation of the Virus:**
  - The probable mutations, is one of the major reasons for making an individual vulnerable to reacquire the COVID-19 infection.

- **Unknown Behaviour of the Virus:**
  - Since the exact behaviour of the novel coronavirus is still being studied, immunity against it is not fully understood.
  - At this stage, it is not fully understood as to how long the antibodies provide protection against the viral infection.
  - Also, in the absence of any vaccination, it is not known whether the immunity acquired by the persons is permanent.

- **False RT-PCR test (Reverse Transcription Polymerase Chain Reaction) Test:**
  - It has been observed that a “false negative” RTPCR test — the RNA test being conducted to diagnose COVID-19 infection — can lead to a patient testing positive a second time after testing negative in between.