COVID-19 and Medical Solutions

Why in News

According to the **World Health Organization (WHO)** the virus **SARS-CoV-2,** has caused the world's largest pandemic infecting nearly six lakh people globally.

- Considering the grave scenario the **discovery of vaccine and the licensed use of a drug** has been **ruled out as an immediate solution** noting that even if the process is fast-tracked, a process would **take over 18 months to be ready for use.**
- Hence, WHO and other health agencies are re-looking the efficacy of **known therapies** such as **convalescent plasma therapy and drugs** to treat **COVID-19.**
    The known drugs include a **combination of two HIV drugs- lopinavir and ritonavir, anti-malaria medications- chloroquine and hydroxychloroquine,** and **antiviral compound namely, remdesivir.**

Efficacy of Known Drugs

- **Anti-Malaria Medications : Chloroquine and Hydroxychloroquine**
    - The **Indian Council of Medical Research (ICMR), has suggested the use of hydroxy-chloroquine to contain the spread of SARS-CoV-2 (Coronavirus) for restricted populations.**
    - Also, the small study conducted in **France** found that it led to a **significant reduction in viral load in COVID-19 patients.**
    - However, Hydroxychloroquine is known to have a **variety of side-effects,** and can in some cases damage the organs like the heart.

- **HIV Drugs- Lopinavir and Ritonavir**
    - The combination drug, ritonavir/lopinavir was introduced **to treat HIV infections.**
    - It was experimented in China with COVID-19 patients but there was **no significant difference observed among them.**
    - Although the drug is generally safe, it **may interact with other drugs** usually given to severely ill patients with other diseases.
    - The drug could cause significant **liver damage.**
- **Antiviral Compound-Remdesivir**
    - The drug, remdesivir is developed to **treat Ebola and related viruses,** is being tested to find out whether it can be used on COVID-19 patients.
    - According to WHO, the drug helps to **prevent COVID-19 viral replication.**
    - It has the best potential and **can be used in high doses without causing toxicities.**

Convalescent Plasma Therapy

- **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.

Source:TH