
2. Kerala gets Nods for Trial of Plasma Therapy

Prelims Syllabus: Science & Technology - Bio Technology

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

Why in News?

- Kerala has gone a step ahead and won Indian Council of Medical Research's (ICMR) approval for the clinical protocol exploring the feasibility of an experimental therapy, convalescent plasma transfusion, which may be administered to severe COVID-19 patients.

Highlights:

- The expert committee which is guiding the State's containment and mitigation strategies against COVID-19 had recommended exploring the plasma therapy following the report in JAMA [Journal of American Medical Association] of a pilot study done by doctors in China.
- In the early 20th century, convalescent plasma treatment was used during outbreaks of diseases such as measles, mumps and influenza.
- More recently, it was used during the H1N1 influenza pandemic, and again in 2013 during the Ebola outbreak in West Africa. In the case of the latter, two patients survived the disease after treatment.
- Following the Ebola outbreak, the World Health Organization issued guidance for its use in treating the disease, saying the small group it was used on showed "promising results."
- Doctors have transfused the blood of recovered patients into those still sick with the 1918 flu, measles, polio, chickenpox and SARS –to varying degrees of success.

Convalescent Plasma Therapy:

- The 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.
- 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.

How is it Done?

- The process to infuse plasma in a patient can be completed quickly.
- It only requires standard blood collection practices, and extraction of plasma.
- If whole blood is donated (350-450 ml), a blood fractionation process is used to separate the plasma. Otherwise, a special machine called aphaeresis machine can be used to extract the plasma directly from the donor.
- While blood is indeed extracted from the donor, the aphaeresis machine separates and extracts the plasma using a plasma kit, and the remaining blood components are returned into the donor's body.

Challenges:

- Despite the potential utility of passive antibody treatments, there have been few concerted efforts to use them as initial therapies against emerging and pandemic infectious threats.
- The absence of large trials certainly contributes to the hesitancy to employ this treatment.
- Also, the most effective formulations (convalescent plasma or hyperimmune globulin, HIg) are unknown.
- Convalescent plasma has the advantage that while its antibodies limit viral replication, other plasma components can also exert beneficial effects such as replenishing coagulation factors when given to patients with haemorrhagic fevers such as Ebola.
- On the other hand, individual convalescent plasma units demonstrate donor-dependent variability in antibody specificities and titers. H-Ig preparations, in contrast, contain standardized antibody doses, although fractionation removes IgM, which may be necessary against some viruses.
- Nonetheless, the construction of a strategic stockpile of frozen, pathogen-reduced plasma, collected from Ebola-convalescent patients with well-characterized viral neutralization activities, is one example of how to proceed despite existing unknowns.