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Correspondence/Letter to Editor

Convalescent plasma: A possible treatment of COVID-19 in India

Dear Editor,

According to statistics by John Hopkins University (JHU) of Medicine, SARS-CoV-2 virus–induced coronavirus disease 2019 (COVID-19) has, to date (April 22, 2020), infected 2,553,853 people across the globe, leading to 176,323 deaths.[1] In India, the statistics for the same date indicate 20,080 infections with 645 deaths (3.21% mortality rate), accounting for 0.79% of global infections and 0.37% of total deaths, although values for India and globally are changing daily, increasing exponentially in India. Official values by the Ministry of Health and Family Welfare of the Government of India reflect slightly lower values.[2] A national lockdown with the aim of containment was implemented in India on March 22, 2020.

Chatterjee et al. modeled the expected outcome of COVID-19 in India with the objective of assessing its impact to appreciate the magnitude of the effect on Indian healthcare services.[3] Using data from March 31 (2020), which according to JHU indicates 330 infections in India, Chatterjee et al. found that, among 11 quarantine scenarios, with 50% effective quarantine, 4412 citizens in India would become infected, while 10% effective quarantine would result in 521 million infections.[3] These grim numbers suggest that solutions other than social distancing are urgently needed to combat the epidemic and to minimize the loss of life.

Lessons learned thus far from the largest outbreaks of this pandemic in China, the US, Italy, and Spain reveal that there is still no cure, although several possible drugs and novel agents, which have not been clinically tested, are available through compassionate use, or as repurposed antiviral and immune-modulating pharmacotherapies.[4] India is likely to also be testing such repurposed drugs, but these can carry risks. A search on PubMed for the term "COVID-19" reveals close to 3900 studies published on this disease, with countless others on preprint servers such as bioRxiv or medRxiv. The wealth of data and the speed at which information related to all aspects of COVID-19 is astonishing, and historical.

One of the hopeful treatments that has emerged is convalescent plasma (CP), or immune plasma. CP, which is plasma that is collected from an infected individual, such as by COVID-19 (i.e., human anti–SARS-CoV-2 plasma), is then transfused into infected patients as a postexposure prophylaxis.[5] Unlike immunoglobulin (IgG)-derived antibodies such as plasma-derived monoclonal antibodies, CP is a passive antibody therapy that showed some success as a neutralizing antibody against other coronavirus epidemics, SARS-1 and Middle East respiratory syndrome (MERS), in the first two decades of the 2000s. CP-derived antibodies can neutralize a virus by preventing replication (e.g., by complement activation or phagocytosis) or by binding without interfering with replication.[6]

In China, five critically ill patients infected with COVID-19 (also with acute respiratory distress syndrome) received a transfusion of SARS-CoV-2–specific IgG (binding titer > 1:1000; neutralization titer > 40) 10–22 days after admission.[7] Their clinical status improved, with three having been discharged after 51–55 days of hospitalization. It should be noted that these patients were also supported by a mechanical ventilator and had also received antiviral agents (combinations of lopinavir, ritonavir, interferon α-1b, favipiravir, arbidol, and/or darunavir) and methylprednisolone, a steroid.

Globally, there is currently no effective postinfection prophylaxis for the treatment of COVID-19, although some drugs are being repurposed. There are also no antibodies for the prevention of COVID-19, and it will likely be months before antibodies emerge from clinical trials. CP, a postinfection treatment, has shown limited and moderate success, previously for SARS-1 and MERS, and for COVID-19 in China, and could serve as a short-term solution to suppress mortality rates in India. As the number of infections increases, the CP of infected patients could be donated or harvested for simultaneous treatment or future use until an effective antibody is discovered.

On March 24, 2020, the US Food and Drug Administration (FDA) approved the use of CP therapy for patients with severe COVID-19 infections.[8] The Indian Council of Medical Research (ICMR) has approved a trial for CR therapy, to be conducted by the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), although approval is still required from the Drug Controller General of India (DCGI).[9]

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