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## Letter to the Editor

## Whole blood derived covid convalescent plasma: An economical option among developing countries



Dear Editor,

### 1. Background

The Covid-19 disease has posed several challenges to the health care system across the world. This pandemic has affected nearly 220 countries as of date December 27, 2020 with an approximately 80 million people affected, 56 million recovered populations across the world and about 10 million affected and 9.7 million recovered cases in India [1]. With high rates of transmission of the disease and with no proven curative treatment available, health care systems across the world are severely overwhelmed.

The covid-19 disease symptoms range from being asymptomatic, mild to moderate self-limiting respiratory tract illness to severe progressive pneumonia, multi-system involvement, multi-organ failure and death [2]. For treatment purposes various therapeutic agents are being explored, in addition to the standard supportive care including oxygen supply, intensive care admission, or even extra-corporeal membrane oxygenation for critically ill patients [3]. Among therapeutic agents Antiviral Drugs, Antibacterials, Antimalarials, Monoclonal Antibodies, Corticosteroids are currently under evaluation for treatment of Covid-19 [4].

### 2. SARS-CoV-2 seroprevalence

Earliest studies of Seroprevalence of SARS-CoV-2 from various parts of the world was found to be: 2.7 % among blood donors by Gallian et al. [5] (March-april 2020); 5.0 % among household population by Pollan et al. [6] (April-May 2020), 11 % among adult volunteers by Vena et al. [7]. (March-April2020), 22.7 % among adults in Blaine by McLaughlin et al. [8]. (May 2020), 31.5 % among asymptomatic residents by Nar-anbhai et al. [9]; 21–37 % among healthy blood donors by Younas et al. [10]. (June-July).

The various studies showed increase in seroprevalence among general population as the blood donors as the SARS-CoV-2-disease expanded into the population [14]. Yet the seroprevalence seems underestimated with disease expanding into the population. With rise in the number of cases and symptomatic cases, the seroprevalence in the general population and so in the donor population shall increase with time.

### 3. Convalescent plasma

Plasma from patients who have recovered from Covid-19 infection namely Convalescent plasma (CP), is a treatment with considerable historical background in other diseases, but still explorative in context of

Covid-19 [11]. Convalescent plasma therapy, a classic adaptive immunotherapy, which was successfully used over past two decades in treatment of SARS, Middle East Respiratory Syndrome (MERS) [11], H1N1(2009) with satisfactory efficacy and safety [12]. Since the virological and clinical characteristics share similarity among SARS, MERS and COVID-19, Convalescent Plasma therapy might be promising treatment for Covid-19 [13].

The convalescent plasma can be whole blood derived convalescent plasma or obtained by apheresis technique which utilises equipment: cell separator and disposable kits. Whole blood derived Convalescent plasma requires an addition of SARS-CoV-2 antibody test to the existing mandatory tests, with no additional sampling requirement except for the ones done at the time of whole blood donation. From the donor units containing SARS-CoV-2-IgG antibodies, FFP can be segregated into Convalescent plasma inventory and stored for use in convalescent plasma therapy. Also heterogeneous units of plasma from at least two donors can be transfused for a single patient, to achieve therapeutic benefit in terms of immune protection from delivery of diverse antibodies [15].

Considering whole blood derived Convalescent plasma shall be an economical option for Convalescent Plasma Therapy in low and middle income countries where basic infrastructure for performing apheresis procedures are not available. Apheresis derived products are expensive, require technical expertise and recipient blood group matched donor. In view of ongoing pandemic, additional efforts by the Blood centres are needed to motivate apheresis donations, where the CP donors carry the fear of losing protective antibodies post donation. Now that the whole blood donations have stabilised

Further, In similar lines of fractionation of plasma derived products like – immunoglobulins, albumin, factor V, VII, VIII concentrates, SARS-CoV-2 antibodies can also be extracted, lyophilized [16] and utilised as a plasma product with longer storage periods and ease of handling, which can even be supplied to remote areas with ease.

With the second wave of Covid-19 and upcoming third wave along with other modalities of treatment, preparedness in terms of CP can be achieved by segregating Whole Blood derived FFP/plasma units with adequate SARS-CoV-2-antibody levels with addition of SARS-CoV-2 antibody test to the whole blood donations along with mandatory tests as per the country's regulations. Also, low prevalence blood group CP stock can be maintained.

### 4. Conclusion

Whole blood derived Covid-Convalescent plasma is the best economical alternative option in low and middle income countries. Also reserves of Covid-convalescent plasma can be maintained with addition

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of SARS-CoV-2 antibody test to the whole blood donations unlike the Apheresis derived Convalescent plasma, which requires additional consumables like Cell separator machines, disposable kits, thereby limiting the bulk stock storage.

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