



BLOOD GROUP DISTRIBUTION AMONG COVID-19 CONVALESCENT PLASMA DONORS

Immunohaematology

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ABSTRACT

Introduction: Corona virus disease- 2019 is caused by severe acute respiratory syndrome- 2 (SARS-CoV-2), also known as Novel corona virus (2019-nCoV). The disease presentation ranges from asymptomatic to severe acute respiratory failure requiring intensive care support. There are multiple drugs, therapies, and vaccine trials underway. One such therapy is convalescent plasma. Passive immunity delivered as anti-corona virus antibodies from convalescent human plasma has promise of emerging as a therapeutic option in the treatment of SARS-CoV-2. **Objective:** The objective of the study is to determine blood group distribution among covid -19 convalescent plasma donors in the Department of blood bank, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. **Materials and Methods:** A retrospective study was conducted at Department of blood bank, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand over a period of 3 months from 01st August to 31st October 2020 who have donated at least one unit of convalescent plasma. **Results:** This study recorded greater number of male donors with B Positive blood group. The convalescent plasma donors were mostly middle aged between 30 to 50 years of age.

KEYWORDS

COVID-19, Convalescent plasma

INTRODUCTION:

Severe acute respiratory syndrome corona virus (SARS-CoV-2), the causative agent of corona virus disease 2019 (COVID-19), emerged in Wuhan, China in December 2019. Following the rapid, global spread of SARS-CoV-2, in March 2020, COVID-19 was declared a pandemic. The disease presentation ranges from asymptomatic to severe acute respiratory failure requiring intensive care support. In the past, convalescent plasma was used as a passive immunization strategy to treat viral diseases, raising expectations that potentially it could be used to treat severe acute respiratory syndrome corona virus (SARS-CoV-2). In the pre-vaccine era, convalescent plasma was used to treat viral diseases such as poliomyelitis, measles, mumps, and influenza, and, more recently, influenza, Ebola virus disease, and severe acute respiratory syndrome corona virus epidemics, with varying degrees of success.¹⁻⁵ In convalescent plasma therapy, blood plasma from a recovered patient is collected and transfused to a symptomatic patient. Convalescent plasma, containing antibodies against severe acute respiratory syndrome corona virus (SARS-CoV-2, the virus that causes COVID-19), might be effective against the infection.

AIM AND OBJECTIVE OF THE STUDY:

The objective of the study is to determine blood group distribution among COVID -19 convalescent plasma donors in the Department of blood bank, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand.

MATERIAL & METHOD:

Study design: A retrospective study was conducted at Department of blood bank, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand from 01st August to 31st October 2020 who have donated at least one unit of convalescent plasma.

Donor recruitment and sample collection:

Patients who had recovered from COVID-19 were recruited as blood donors for this study. All patients aged 18-60 who had a confirmed COVID-19 and has recovered from illness.

IgG antibody titers

IgG antibody titers were measured in the Department of blood bank, Rajendra Institute of Medical Sciences Ranchi, Jharkhand using chemiluminescence immunoassay method. Person with serum IgG

antibody value ≥ 1 RLU is considered as Positive result whereas Positive values for IgG antibody assays were serum values ≥ 4.0 RLU which is directly proportional to 1:80 or 1:160 is considered for convalescent plasma therapy.

Assessment of donor for eligibility:

COVID-19 convalescent plasma will be collected from recovered individuals if they are eligible to donate blood.

Eligibility of convalescent COVID-19 patients to donate plasma should be based on:

1. Patient-donor, with virologically documented diagnosis of COVID-19, completely recovered by at least 14 days according to the clinical and laboratory criteria defined by the ICMR on 28 February 2020 ("The recovered patient is the one who resolves the symptoms of COVID-19 infection and who is negative in two consecutive tests, carried out 24 h apart).
2. If plasma is collected prior to 28 days after full recovery from illness, then confirmation of the resolution of the infection should be obtained through demonstration of one non-reactive Nucleic Acid Tests (NAT) for SARS-CoV-2 or RT-PCR
3. Male patient donor or a nulliparous female donor with a negative history of blood component transfusion. To avoid the risk of Transfusion Related Acute Lung Injury (TRALI) preference should be given to use of plasma from male donors or from female donors who have never been pregnant including abortions. This measure lowers the possibility of presence in the plasma of the antibodies to HLA or granulocyte antigens that cause TRALI.

RESULTS:

In this study, 208 convalescent plasma donors were recruited successfully. In Table 1, there were more male donors (n = 206, 99.04%) as compared with female donors (n = 02, 0.96%).

In Table 2, the most common blood type among the donors was blood group B (n = 86, 41.35%), followed by blood group O (n=64, 30.77%), blood group A (n=40, 19.23%) and blood group AB (n=18, 8.65%). As shown in Table 2, 97.12% (n = 202) of participants were Rhesus positive while 2.88% (n = 06) were Rh negative. Except for blood group A, all of the other blood groups had Rh-negative antigens in the donated blood.

According to Table no 3 out of total 208 donors, 40 was A Positive and 00 A Negative, 85 B Positive, 01 B Negative, 60 O Positive, 04 O Negative, 17 AB Positive and 01 AB Negative. So maximum donors were B Positive and no donor of A Negative.

Table 1: Gender distribution of the donors (N = 208)

Sex	Frequency (n)	Percentage (%)
Male	206	99.04%
Female	02	0.96%
Total	208	

Table 2 Blood type and Rh antigens of the donors (N = 208)

Blood Type	Frequency(n)
A	40, 19.23%
B	86, 41.35%
O	64, 30.77%
AB	18, 8.65%
<i>Rh Antigen</i>	
Rh Positive	202, 97.12%
Rh Negative	06, 2.88%
Total	208

Table 3: Distribution of Rh antigens per ABO blood group among donors (N = 208)

Blood Group	Rh +ve n (%)	Rh -ve n (%)	Total
A	40, 19.23%	00, 00%	40
B	85, 40.87%	01, 0.48%	86
O	60, 28.85%	04, 1.92%	64
AB	17, 8.17%	01, 0.48%	18
			208

DISCUSSION:

This study determined the distribution of ABO and Rh antigens among convalescent plasma donors in the Department of blood bank, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. The study showed that the majority of donors were male. The commonest blood group among convalescent plasma donors was B Positive. Almost all the blood groups are vulnerable to SARS COVID-19 infection.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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