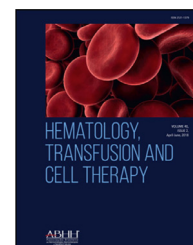




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Letter to the Editor

Characterization of convalescent plasma: Findings reported between aliquots of donors and units processed in a Blood Bank in Lima-Peru

1 Dear Editor

2 The disease produced by SARS-CoV-2 had a significant impact
3 around the world. According to the Peru's Health Ministry, on
4 22 August 2021, the percentage of positive cases was 13.04%
5 and the fatality was 9.24%.¹ Plasma convalescence was a
6 treatment of choice, however, since the clinical trial RECOV-
7 ERY did not demonstrate significant differences in 28-day
8 mortality between the care group (24%) and the plasma con-
9 valescent group (24%).²

10 In response to the pandemic, we designed a phase II trial
11 of convalescent plasma in patients with moderate COVID-19
12 (Register at the National Institute of Health of Peru #PER-03-
13 020). Due to the results of the RECOVERY trial, we decided to
14 stop our study early after enrolling 10 convalescent donors,
15 while no COVID-19 patients received the administration of
16 convalescent plasma.

17 In this letter, we present the secondary aim of this trial
18 that was to compare the biochemical, hematological, and
19 serological values of the convalescent plasmas against
20 COVID-19 with convalescent plasma donors obtained from
21 volunteers' apheresis.

22 The inclusion criteria for donors were an age between 18
23 and 60 years, a positive test for SARS-CoV-2 by RT-PCR of a
24 nasopharyngeal sample, complete remission of symptoms at
25 least 28 days before plasma donation or a negative test by RT-
26 PCR of a nasopharyngeal sample and IgG anti-SARS-CoV-2 1:
27 200 determined by ELISA and. In addition, comply with the
28 technical requirements for selecting human blood donors
29 given by the Ministry of Health of Peru.³

30 Overall, 10 out of 35 candidates met the criteria issued
31 by the Peruvian National Blood Program COVID-19 conva-
32 lescent plasma.⁴ Seven donors presented antibodies
33 against COVID-19 (ELISA Euroimmun dosing). The collec-
34 tion was from August 2020 to May 2021, obtaining 20 units
35 of convalescent plasmas by collecting apheresis. In the

blast freezer, the units were subjected to ultraviolet-based 36
pathogen inactivation using riboflavin and rapid freeze 37
plasma at -40°C. The evaluated analytes included factor 38
VIII (by coagulometry with the Siemens kit), SARS-CoV2 39
antibodies IgG N antibodies of SARS-CoV2 (by Diasorin 40
Chemiluminescent Immunoassay), total SARS-CoV-2 (by 41
the Roche electrochemiluminescence Immunoassay), 42
SARS-CoV2 IGG antibodies of SARS-CoV2 (by enzyme- 43
linked immunosorbent assay), C3 and C4 (by Roche Immu- 44
noturbidimetry) and total proteins (by Colorimetric Roche 45
kit). R Studio was used to analyze the data collected. 46

47 Although we had a very small sample size, we were able to 47
find correlations between some clinical features of patients 48
and SARS-CoV2 antibodies production. Body mass index 49
(BMI) was directly related with the donor's neutralization 50
antibodies ($p=0.8628$; Figure 1A). Frasca, et al, described this 51
correlation previously, in the study, the production of anti- 52
bodies between thin and obese patients was compared, where 53
it was observed that there is a tendency for thin patients to 54
produce more antibodies.⁴ 55

56 Days of convalescent was related with production of anti- 56
bodies, comparing before and after 14 days or 21 days 57
($p=0.000$; Figure 1B and 1C). However, Seow et al reported that 58
SARS-CoV-2 antibodies were detected in most infected people 59
between 10-15 days after the presence of symptoms.⁵ In 60
another study, patient donations were between 1 to 40 days 61
from the onset of COVID-19 symptoms. To accept the dona- 62
tion, antibodies against SARS-CoV-2 (IgG) had to be detected 63
between 1:100–1:3200.⁶ 64

65 Regarding to biochemical markers, level of proteins was 65
positively related to neutralizing antibodies of the units of 66
convalescent plasma ($p=0.12$), Figure 1D. Antibody responses 67
against the spike protein of SARS-CoV-2 have been shown to 68
be detectable between 1 and 3 weeks from the onset of 69
symptoms.^{7,8} On the other hand, the correlation between 70
globulins and neutralizing antibodies was significant ($p=0.01$; 71
Figure 1E). 72

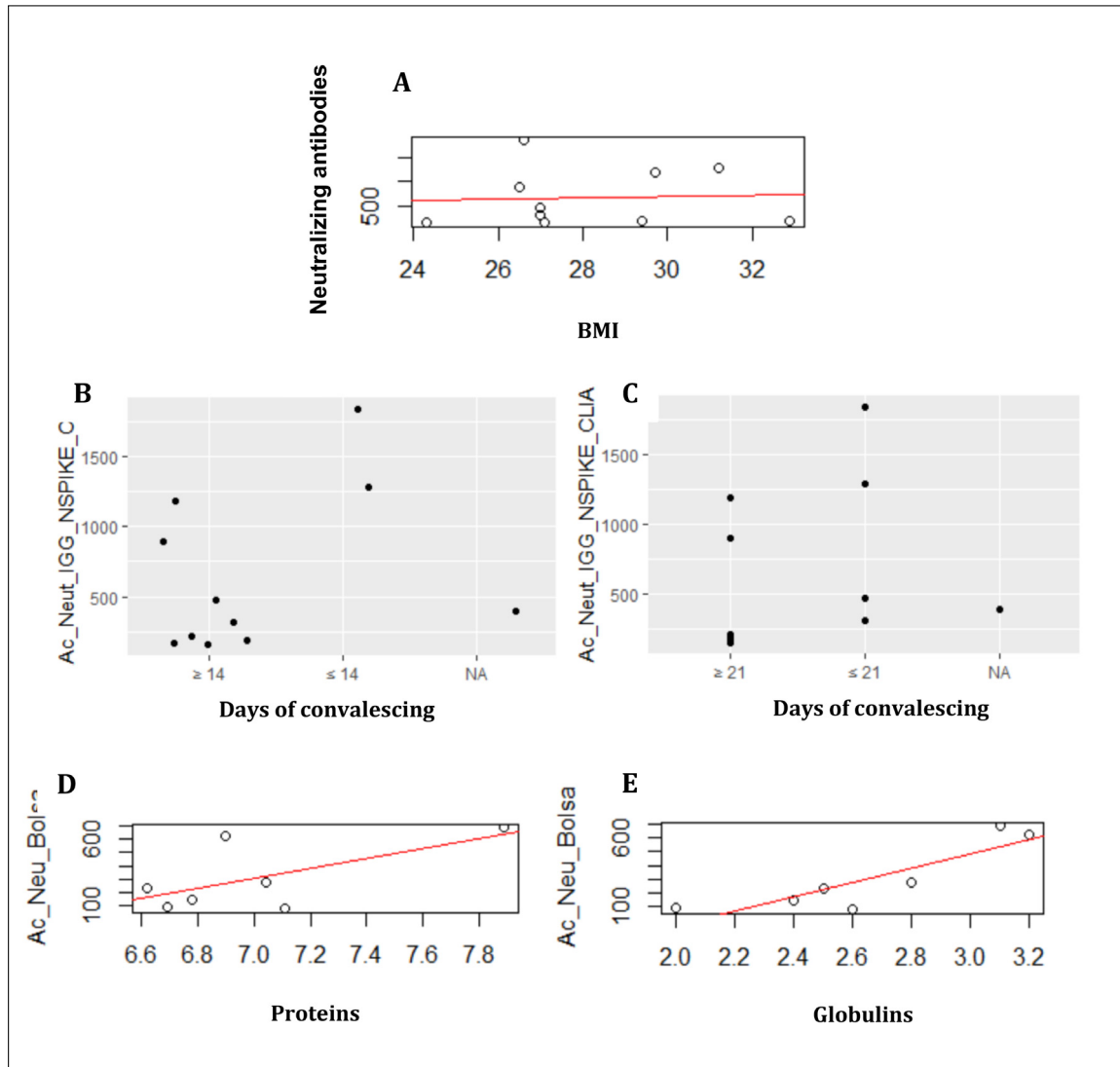


Figure 1–A. BMI were correlated with the production of neutralizing antibodies. B. The convalescence days were evaluated on 14 days. C. The convalescence assessed days on 21 days. The analysis of the donors bag. D. The correlation between proteins and neutralizing antibodies. E. The correlation between globulin and neutralizing antibodies.

73 Although convalescent plasma had not efficacy in the
74 treatment of COVID-19, we learned about the production of
75 neutralizing anti-SARS-CoV-2 antibodies and clinical varia-
76 bles associated to it.

77 Statements and Declarations

78 Authors have no interests that are directly or indirectly
79 related to the work submitted for publication.

80 Conflicts of interest

81 The authors declare no conflicts of interest.

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