

ABO Blood Group Association With COVID-19 Mortality

Hira Akhlaq^a, Parastou Tizro^b, Anita Aggarwal^{a, c}, Victor E. Nava^{a, c, d}

To the Editor

We were intrigued by the conclusion of Kumar et al [1] that once patients are hospitalized with coronavirus disease 2019 (COVID-19) infection, blood type is not associated with severe disease or in-hospital mortality. During this global pandemic controversial data have been published on this topic. Initial studies suggested that the lethality risk was increased or decreased with blood type A and O, respectively [2]. However, subsequent multivariate analysis found no association between blood type and risk of intubation or death after COVID-19 infection [3]. Furthermore, a large study with more than 11,000 predominantly white race (83%) individuals concluded that ABO groups were not associated with disease susceptibility or severity and were unlikely to be useful predictors of COVID-19 severity in similar ancestries, raising the importance of extending these observations to more diverse populations [4]. Of interest, Apea et al recently demonstrated higher mortality in patients from Asian and black backgrounds during COVID-19 infection after controlling for obvious confounders and frailty [5].

In the Washington, DC Veterans Affairs Medical Center, we are strategically situated to further investigate the outcomes of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in blacks since they represent approximately 60% of our patients. After Institutional Review Board approval, we followed 201 patients requiring hospitalization due to COVID-19 infection during 7 consecutive months (March to October 2020) through a retrospective chart review. All infections were confirmed by reverse transcriptase-polymerase chain reaction (RT-PCR) for SARS-CoV-2. The overall mortality was 38.5% due to older age and high frequency of comorbidities in our veteran population. Only patients with known blood type were included for further analysis, reducing our cohort to 123. Demographically, this subset was mostly male (116 of 123, 94.3%) with an average age of 69.5 years, of which 73% were blacks. Fifty-four out of 123 patients died in the hospital, representing a mortality of 43.9%. Only 5.7% of

the patients (seven of 123) were female, who showed a slightly increased mortality of 57.1% (four of seven patients), which may not be significant and could not be explained by a higher average age when compared with the older male subset (65 vs. 70.9 years, respectively). Due to the limited number of females in our cohort, we concentrated on the analysis of male mortality regarding blood type, which was as follows: 66.7% (two of three patients) for A-negative, 44.4% (11 of 25 patients) for A-positive, 100% (one of one patient) for AB-negative, 44.4% (four of nine patients) for AB-positive, 0% (zero of three patients) for B-negative, 42.9% (six of 14 patients) for B-positive, 0% (zero of one patient) for O-negative and 39.0% (23 of 58 patients) for O-positive. Statistical analysis using Fisher exact test comparing all possible combinations, revealed no significant differences associated with ABO blood type (A vs. AB $P = 1$, A vs. B $P = 0.3771$, A vs. O $P = 0.5072$, B vs. O $P = 0.7625$, AB vs. O $P = 0.5096$ and AB vs. B $P = 0.4384$) or the Rhesus (Rh) factor (A- vs. A+ $P = 0.3326$, AB- vs. AB+ $P = 1$, B- vs. B+ $P = 0.5167$, B- vs. B+ $P = 0.5167$, O- vs. O+ $P = 1$, combined Rh- vs. Rh+ $P = 1$).

In summary, an association between blood type and COVID-19 mortality was absent in a predominantly black male population hospitalized at our institution, in agreement with previous reports analyzing mostly Northern European patients [3, 4].

Further research with larger cohorts, including diverse variables (genetic profiling and viral strain analysis) is necessary to prognosticate COVID-19 severity.

Acknowledgments

None to declare.

Financial Disclosure

The authors have no financial interest to disclose.

Conflict of Interest

The authors have no conflict of interest to disclose.

Informed Consent

Not applicable.

Manuscript submitted February 28, 2022, accepted April 7, 2022
Published online June 27, 2022

^aVeterans Affairs Medical Center, Washington, DC 20052, USA

^bCity of Hope Comprehensive Cancer Center, Duarte, CA, USA

^cGeorge Washington University, Washington, DC, USA

^dCorresponding Author: Victor E. Nava, Veterans Affairs Medical Center, Washington, DC 20052, USA. Email: Victor.nava@va.gov

doi: <https://doi.org/10.14740/jh993>

Author Contributions

HA wrote the letter and carried out data analysis. PT carried out data analysis and editing. AA worked on data acquisition, data organization and conception. VN worked on conception, data analysis and manuscript editing.

Data Availability

The data sets for the article are maintained according to institutional research board guidelines and available upon request.

References

1. Kumar G, Nanchal R, Hererra M, Sakhuja A, Patel D, Meersman M, Dalton D, et al. Does ABO blood groups affect outcomes in hospitalized COVID-19 patients? *J Hematol.* 2021;10(3):98-105.
2. Zhao J, Yang Y, Huang H, Li D, Gu D, Lu X, Zhang Z, et al. Relationship between the ABO blood group and the coronavirus disease 2019 (COVID-19) susceptibility. *Clin Infect Dis.* 2021;73(2):328-331.
3. Latz CA, DeCarlo C, Boitano L, Png CYM, Patell R, Conrad MF, Eagleton M, et al. Blood type and outcomes in patients with COVID-19. *Ann Hematol.* 2020;99(9):2113-2118.
4. Anderson JL, May HT, Knight S, Bair TL, Muhlestein JB, Knowlton KU, Horne BD. Association of sociodemographic factors and blood group type with risk of COVID-19 in a US population. *JAMA Netw Open.* 2021;4(4):e217429.
5. Apea VJ, Wan YI, Dhairyawan R, Puthuchery ZA, Pearse RM, Orkin CM, Prowle JR. Ethnicity and outcomes in patients hospitalised with COVID-19 infection in East London: an observational cohort study. *BMJ Open.* 2021;11(1):e042140.