

Review of: "SARS-CoV-2 Infection and Blood Group Associations in the United Arab Emirates"

Mohamed Jaber¹

¹ Clinical Sciences, Ajman University of Science & Technology, United Arab Emirates

Potential competing interests: No potential competing interests to declare.

Review Report

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Title: "SARS-CoV-2 Infection and Blood Group Associations in the United Arab Emirates"

- Keywords: COVID-19, SARS-CoV-2, Blood Group, ABO Blood Type, Rhesus Factor, UAE, Infection Susceptibility, Disease Severity. The keywords are generally appropriate for capturing the scope of the study and are likely to assist with indexing. However, some keywords, such as "Diabetes" and "Cross-sectional Study," could be added for additional specificity.
- The abstract succinctly outlines the study's purpose, methodology, findings, and implications. It provides the reader with a clear understanding of the research question—namely, the association between blood groups and COVID-19 susceptibility and severity in the UAE population.
- The study exhibits strong rigor in terms of design, data collection, and statistical analysis. The authors conducted a retrospective cross-sectional study with 308 COVID-19-positive patients, examining the ABO blood type and Rh factor as potential variables influencing infection susceptibility and severity. Statistical analyses included Chi-square tests and odds ratios, ensuring robust comparisons.
- The manuscript is well-written, though certain sections, particularly the discussion, could benefit from simplification and further clarity. The language is formal, suitable for a scientific audience, and demonstrates clarity in reporting results and methodology.
- The literature review provides a comprehensive background on the potential relationship between blood groups and susceptibility to infections, referencing key studies from multiple regions, particularly from China and Saudi Arabia. However, citations and studies from more recent years could add context, particularly studies exploring blood group susceptibility to COVID-19 variants. Additionally, sources discussing COVID-19 and comorbidities like diabetes in the UAE could strengthen the background.
- The study identifies a critical knowledge gap by focusing on a UAE-based population, where such studies are scarce. By exploring associations specific to this region, the authors address an underrepresented area in COVID-19 susceptibility research, providing data that may have implications for public health policies in the UAE and similar demographics.
- The sample size of 308 COVID-19-positive patients is moderate but appropriate for a study of this nature, especially

given the cross-sectional design. The authors also include a control group of blood donors (n=500), enhancing the comparative strength of the study.

- The study design is straightforward, involving a cross-sectional analysis of retrospective data from two medical facilities. The methodology includes: Data collection based on nasopharyngeal PCR-confirmed COVID-19 patients. Classification of patients by disease severity (mild, moderate, severe) based on clinical and laboratory records. Assessment of blood types (ABO, Rh) and statistical analyses.
- The methodology is appropriate and adequately detailed. However, adding a discussion of possible confounding variables (e.g., age, pre-existing conditions) would further strengthen the methodological rigor. This addition would be valuable in interpreting whether blood group associations with COVID-19 susceptibility are independent of other demographic and health variables.
- The statistical analysis section demonstrates appropriate use of Chi-square and odds ratio tests to assess blood type associations with COVID-19 susceptibility and severity. Using R software for analysis is suitable, though a multivariable analysis (such as logistic regression) might provide insights into interactions among variables (e.g., age, diabetes status).
- The authors present a valid result, identifying a statistically significant association between blood group B and increased COVID-19 susceptibility, with no association found between Rh factor and severity. However, without adjustments for potential confounders, conclusions about causation or direct associations are limited.
- The discussion section effectively interprets the study results, comparing findings with prior research. However, there are areas for enhancement; the authors could expand on comparisons with studies in populations with a high prevalence of diabetes, given the large number of diabetic individuals in the UAE. The lack of association between blood group and disease severity could be further discussed in relation to immune response mechanisms.
- The conclusion is well-founded, indicating that while blood group B shows an increased association with COVID-19 susceptibility, it does not impact disease severity or mortality. This finding is significant as it contributes to an evolving understanding of COVID-19 and blood group associations in different populations.
- The study's limitations are not explicitly discussed. However, some limitations that should be acknowledged include:

I. Retrospective Nature may Limit the ability to establish causation.

II. Confounding Variables: Lack of adjustment for factors like diabetes, age, and co-morbid conditions could affect results.

III. Results may not generalize outside the UAE due to unique population genetics.

Recommendations for Improvement

- Discussion of Confounding Factors such as age, comorbidities, and other potential confounders.
- Expansion of the Literature Review and inclusion of additional recent studies to enhance context, especially those focusing on COVID-19 and comorbid conditions in the Middle Eastern population.
- Explicitly state limitations regarding sample selection, population generalizability, and retrospective nature.
- Simplify and expand the interpretation of findings in relation to existing literature on immunological mechanisms behind blood group susceptibility to infections.

Suitability for Publication

Overall, this manuscript presents an insightful study that adds valuable information to our understanding of blood group associations with COVID-19 in the UAE population.

The main strengths of the study are the regional focus on the UAE, systematic approach to data collection, and robust statistical analysis using odds ratios. However, the weaknesses of the study are the limited control for confounders, absence of multivariable analysis, and reliance on blood donors as a control group rather than a healthy general population.

Therefore, this study is suitable for publication due to its relevance to COVID-19 research, particularly in underrepresented populations. Minor adjustments, such as acknowledging limitations and elaborating on potential confounders, would improve the manuscript's rigor.