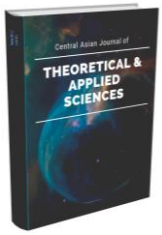

CENTRAL ASIAN JOURNAL OF THEORETICAL AND APPLIED SCIENCE

https://cajotas.centralasianstudies.org/index.php/CAJOTAS

Volume: 06 Issue: 04 | October 2025 ISSN: 2660-5317

Article

Different Responses of Blood Group (ABO) to Acute Respiratory Infections with the COVID-19 (SARS-CoV-2) Field Statistical Study

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Abstract: The Data of this paper were taken from a sample of 1000 patients infected with COVID-19, who were hospitalized in Al-Zahra Teaching Hospital in Kut city – Iraq, in the Al Shifa center, during the period (06/08/2020 to 12/13/2020). A normal oxygen level for healthy lungs is 75 and 100 millimeters of mercury (mm Hg). As shown by the pulse oximeter, between 95-100% (Its mean 75-100 mm Hg). D-dimer tests, normal equal to or less than 500 nanograms/ml. All samples of hospitalized patients are those whose blood oxygen levels were recorded at less than 95% and D-dimer test levels more than 500 ng/ml. This was the study's indicator of acute lung infection with COVID-19. The most commonly recorded blood type infected with COVID-19 around the world was A+, followed by B+, and then AB+, while O+ was the blood group least infected with the virus. According to this study's design, blood type AB has the lowest prevalence in communities worldwide. For this reason, individuals with this blood type were the lowest percentage among those who entered the Al-Shifa Center in late 2020. Similarly, the incidence of severe acute respiratory infection due to COVID-19 in people with blood type A may also be within the normal range, and there may be no relationship between blood types and COVID-19 infection. After the study, we recommended establishing accurate databases for population-based blood type ratios to ensure clear statistical studies and more accurate analysis of patient data. The results showed no clear association between blood type and acute respiratory infection due to COVID-19. We recommend providing clear data for every individual worldwide, identifying their blood type, linked to a global database that provides a clear definition of the percentage of blood type distribution worldwide. Currently available data does not provide accurate information.

Keywords: COVID-19, ABO Blood Group, SARS-CoV-2, Patients, Population

Citation: Muslim W. M., Nhaer A. G., Abed J. H. Different Responses of Blood Group (ABO) to Acute Respiratory Infections with the COVID-19 (SARS-CoV-2) Field Statistical Study. Central Asian Journal of Theoretical and Applied Science 2025, 6(4), 684-688.

Received: 30th Jun 2025
Revised: 10th Jul 2025
Accepted: 29th Jul 2025
Published: 16th Aug 2025

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1. Introduction

The ABO blood group is crucial in some illnesses, like cardiovascular disease [1] and cancer [2]. However, there is currently little clear evidence between COVID-19 to ABO groups. This study was, therefore, aimed at assessing the association between ABO blood type and the acute respiratory infection of patients infected with COVID-19 in AL Zahra Hospital in Kut city, Iraq. Since the COVID-19 pandemic (Coronavirus disease of 2019 or SARS-CoV-2) appeared and spread around the world, reports have emerged about a relationship between blood types and infection with this virus. Whereby blood group O appears associated with a lower risk of COVID-19, while non-O blood types appear detrimental [3]. More than one report talked about such a relationship between ABO

groups and COVID-19 [1], [2], [3]. [4] The majority of reports relied on examining the blood ABO groups of those who were recorded to be infected with COVID-19. Most studies have indicated that the majority of infections in China, Iraq, Lebanon, Turkey, and Denmark were in blood type A [5] [4], [5], [6]. In this paper, severe COVID-19 infections were taken into account in which the oxygen level was recorded (less than 75 mmHg) or, according to the oximeter reading, less than 95%, and the D-dimer test was more than 500 ng/ml. One study found that individuals have blood group A are the weakest among the other blood groups due to the long period of treatment that patients from this group need. The cellular and humoral immune response in individuals with blood group A requires a longer period to stimulate the immune response to the COVID-19 infection, so group A individuals require a longer treatment period. [6] Through the statistics in this paper, we will discuss these ideas and whether the results of our statistical study agree with them or not [7], [8], [9].

2. Materials and Methods

Study participants

This information was collected from the records of Al-Zahra General Hospital, Al-Shifa Center, in the city of Kut, between 8 jun.2020 - 13 December 2020. The Al-Shifa Center is a special wing of the hospital dedicated to severely ill COVID-19 patients admitted to the facility, with a capacity of 100 beds. Data was taken from hospital records of 1,000 patients admitted to the center over approximately six months. ABO readings we obtained of those patients are confirmed infected by PCR analyses and x-ray examination (CT scan) for lung, less than 95% oximeter records, and measured plasma coagulation markers (D-dimer) in a high proportion of these patients. The Data were taken from hospital records of 1000 patient samples infected with the coronavirus COVID-19, who were hospitalized in Al-Zahra Teaching Hospital in Kut city – Iraq, during the period (06/08/2020 to 12/13/2020). A normal oxygen level for healthy lungs is 75 and 100 millimeters of mercury (mm Hg). As shown by the pulse oximeter, between 95-100% (Its mean 75- 100 mm Hg). D-dimer tests, normal equal to or less than 500 nanograms/ml. All samples of hospitalized patients are those whose blood oxygen levels were recorded at less than 95% and D-dimer test levels more than 500 ng/ml. This refers to an acute respiratory infection caused by the new coronavirus, COVID-19.

3. Results

According to the table below, which shows the infected numbers out of the total sample for each blood group in Table 1 in Al-Shifa Center :

Table 1. infected numbers out of the total sample for each blood group.

Sequence	Blood groups	No. of patients
1	A+	326
2	A-	9
3	B+	281
4	B-	6
5	O+	258
6	O-	8
7	AB+	101
8	AB-	11

The most recorded blood group was A (33.5 %), followed by B (28.7%), then O (26.6 %), while AB (11.2%) was the least infected blood group with the virus. The results of this study are consistent with most of the studies we mentioned previously, which

indicated that blood type A is more susceptible to COVID-19 infection and that blood type O is less susceptible. However, in this paper's statistics, blood type AB appears to have the lowest rate of acute respiratory infection. This may be the reason for the discrepancy in the results. The sample of infected people counted at Al-Shifa Center included patients diagnosed with severe infection [10].

4. Data Analysis

Most of the statistics around the world were trying to sort between blood types based on the diagnosis of infection (positive or negative) without taking into account the study of acute infections only, as in this paper [11]. The following chart in Figure 1 shows the relationship between the number of people infected (according to blood type) with severe pneumonia due to complications of coronavirus infection [12], [13], [14]. We note that most infections are in blood types A+ and O+. All these patients have: As shown in hospital records by the pulse oximeter, less than 95%, and D-dimer tests more than 500 nanograms/ml, see Figure 1.

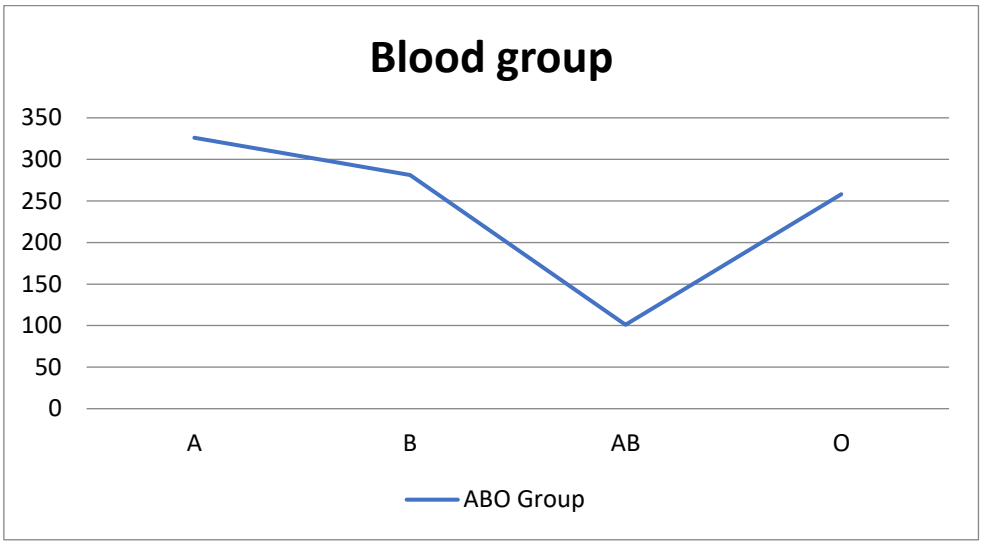

Figure 1. Patient Numbers and ABO groups. Most cases of acute respiratory infection (due to the COVID-19 virus) are A+, B+, O+, and finally AB+, the blood group with the least infection.

5. Discussion

Many studies have recorded a relationship between ABO blood groups and infection with Covid-19 (SARS-CoV-2). Most studies consider that blood group A is more susceptible to infection with COVID-19, followed by B, then AB, and finally group O (7) [15]. As mentioned in the introduction. Statistical results in this paper showed that there is an "apparent" relationship between people's COVID-19 infection and their blood group, but, in our study, the order appeared with some differences: A, then B, then O, and finally AB. The reason for this result is that the AB blood type is rare in the community. By examining statistics from various regions of the world (8) (9) (10), we can easily determine that the AB blood type is rare. It's quite natural that the percentage of people carrying this blood type would be lower among those infected with the COVID-19 virus. Now let's show table 2.

Table 2. A sample of global distribution of ABO blood types.

1-	Eastern Saudi Arabia (8)	: A : 26%, B : 18%, O 52 %, AB 4%
2-	Southern Korea (9)	: A : 34%, B : 27%, O 27%, AB 12%

3-	Horn of Africa (2020) (10) 6 %	: A : 30%, B : 24%, O 40%, AB
4-	North America (2018) (10) 2%	: A : 27%, B : 9%, O: 62%, AB:

This data, taken from different places in the world and at different times as well, shows that the data we collected at the Al-Shifa Center for a thousand patients approximates the normal distribution of blood types in the South Korean model (number 2 above). Samples from South Korea, Saudi Arabia, the Horn of Africa, and North America show variations in the proportion of people with blood types O and A, with similar results regarding the rarity of type AB. Therefore, the low incidence of infections in individuals has AB blood type is normal, where this does not mean that this blood type is more resistant to disease. Similarly, blood type A may not be the weakest, nor O the strongest. The results are still unclear, and there appears to be no link between ABO blood groups and acute respiratory infection due to infection with COVID-19.

6. Conclusion

The results showed no clear association between blood type and acute respiratory infection due to COVID-19. We recommend providing clear data for every individual worldwide to identify their blood type, linked to a global database that provides a clear definition of the percentage of blood type distribution worldwide. Currently available data does not provide accurate information.

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