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Association between ABO Blood Group System and the Severity of COVID-19 in the West Bank: A Case-control Study

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ABSTRACT

Introduction: Several studies have examined risk factors for COVID-19, and there have been conflicting results regarding whether blood type influences the risk of COVID-19. Therefore, this study aimed to determine the association between the ABO blood group system and the severity of COVID-19 in the West Bank of Palestine.

Methods: A case-control study design was used, consisting of 169 cases and 169 controls who had undergone COVID-19 PCR testing in March 2021 in the West Bank, stratified according to their test results. A self-administered questionnaire in Arabic was used, which included the following parts: socio-demographic data, smoking status, seasonal flu, medical history of COVID-19, and the experience of COVID-19 cases. Both descriptive and analytical analyses were carried out. Binary logistic regression (Enter model) was used in the multivariate analysis to demonstrate the odds ratio.

Results: The study included 338 participants (169 cases and 169 controls) with a 95% response rate. Among the participants, 46.4% lived in the northern region (Nablus, Jenin, Qalqilya, Salfit, Tubas, Tulkarm). Blood group B was found to be more protective against COVID-19 than blood group A (AOR=0.40, CI=0.223-0.718). Blood group AB was also more protective against COVID-19 than blood group A ($P < 0.05$, AOR=0.316, CI=0.143-0.698). There was no statistically significant difference between blood group A and blood group O concerning the severity of symptoms or the composite outcomes of COVID-19.

Conclusion: There is an association between the ABO blood group and the risk of COVID-19. Nonetheless, the precise mechanism and severity of the effect vary, necessitating further investigation through larger and more intensively controlled studies.

Keywords: Palestine, Covid-19, blood type, severity of symptoms.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a pandemic respiratory infection caused by a novel coronavirus known as Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) [1]. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. This extremely infectious virus can be asymptomatic or present with mild to severe symptoms, and it may be life-threatening to high-risk individuals such as the elderly, patients with immunosuppression, and those with underlying medical conditions such as cardiovascular disease and cancer [2]. The virus is transmitted from person to person among both symptomatic and asymptomatic individuals [3].

Researchers have explored the mechanisms of viral entry into human hosts via endocytosis, histo-blood group antigen, cell surface receptors, and acetylcholine receptors in respiratory diseases. There is documented evidence of auto-antigenicity and hematological problems, such as the agglutination of red

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blood cells by the serum from infected individuals [4]. In 1901, Karl Landsteiner discovered the ABO blood group system, which encouraged researchers to investigate the connection between the ABO blood group system and various diseases. It has been suggested that many bacterial and viral infections, such as Helicobacter pylori, norovirus, hepatitis B virus, and severe acute respiratory syndrome coronavirus (SARS-CoV), are associated with the ABO blood group system [5].

Moreover, understanding the link between illnesses that have resulted in pandemics and blood types might be a helpful risk factor for predicting outcomes and developing effective strategies to combat disease transmission in relation to blood group distributions [6]. There are significant uncertainties regarding blood type and MERS infection during the severe acute respiratory syndrome coronavirus (SARS-CoV) episode that began in late 2002, along with risk factors that may exacerbate disease severity and progression [7]. This has often led to increased symptom severity and raised more questions than answers regarding susceptibility to COVID-19, which has recently been linked to ABO blood groups in patients [7].

This study aimed to assess the association between blood group and the severity of COVID-19 in Palestine.

METHODOLOGY

Sampling method

The study was conducted across all governorates in the West Bank that had tested for COVID-19 from March 1, 2021, to March 31, 2021 (Bethlehem, Hebron, Jericho, Ramallah, Nablus, Jenin, Qalqilya, Salfit, Tubas, Tulkarm, and Jerusalem) using a case-control study design and stratified systematic sampling method. There is an electronic Excel sheet program called the District Health Information System for COVID-19 (DHIS), which is used by all health directorates to enter the contact information of patients conducting PCR tests along with the test results.

First, the researcher obtained the electronic Excel sheet file for all governorates of the West Bank from the Palestinian Ministry of Health. Then, the data were stratified according to their COVID-19 PCR results into two groups: the first stratum was positive, and the second stratum was negative. After that, the researcher systematically selected the patients from each stratum using a kth interval by dividing the entire population size by the desired sample size [8].

The following operational definitions were enrolled in the study:

The Risk: The susceptibility to have positive result of COVID-19 PCR.

The severity of symptoms: They are categorized into: (Mild, Moderate, Severe, and Critical illness) which defined according to WHO as the following:

Mild symptoms: These include low-grade fever (not more than 100 degrees Fahrenheit), cough, sore throat, malaise, headache, muscle pain, congestion or runny nose, loss of taste or smell, and diarrhea without shortness of breath (9).

Moderate symptoms: A patient might start to show evidence of lower respiratory disease, fever of about 101-102 degrees Fahrenheit, and chills with repeated shaking, but they still have good oxygenation on room air in addition to any of the mild symptoms [9].

Severe symptoms: These include shortness of breath (generally breathing quickly over 30 times a minute), chest discomfort, confusion/unresponsiveness and oxygenation level is less than 94%, and which generally means that the patient needs supplemental oxygen [9].

Critical illness: These include the signs of respiratory failure and the need for a breathing machine and patients may experience other organ dysfunction and shock which require to intensive care unit (9).

COVID-19 outcomes: They are categorized into: (Require mechanical ventilation, Admission to intensive care unit, Complications post COVID-19).

Inclusion Criteria

Cases were defined by the final nasal or pharyngeal swab is a positive result, only alive patients were selected, have contact information at the Ministry of Health register file as the phone number, know their ABO Blood group and have signs and symptoms.

The controls who have tested negative result for the COVID-19 PCR from the health electronic data from 1/3/2021 until 31/3/2021. As it should be the final nasal or pharyngeal swab is a negative result, only alive patients were selected, have contact information at the Ministry of Health register file as the phone number, know their ABO Blood group and not infected with COVID-19 previously.

Exclusion Criteria

The selected controls were excluded if they had a positive result before the last one, refused to participate in the study, or did not know their ABO blood group. The selected cases were excluded if they were asymptomatic, had died, were in critical condition and unable to answer the questionnaire, did not know their ABO blood group, or refused to participate in the study. In our study, 9 cases and 9 controls were excluded because 13 subjects did not know their blood group and 5 refused to participate.

Sample size determination

The sample size for the case-control study was determined with 95% confidence. The association between the ABO blood group and COVID-19 has 80% power and an estimated odds ratio of 2.0, with a case-control ratio of 1:1. A hypothetical assumption of risk (20%) was applied to the control group, as stated in the literature for a similar study conducted in Saudi Arabia. The distribution of blood groups between Saudi Arabia and Palestine is similar, with the most prevalent blood groups being A and O [10]. This generated a total sample size of 372 for the study. 34 pairs of cases and controls were excluded: 16 for the piloting study and 18 because they did not meet the selection criteria, resulting in a total sample size of 338.

Data Collection Procedure

Data collection took place between March 25, 2021, and April 25, 2021. The health electronic files available for those with a positive or negative PCR test were used, and participants were contacted via phone for about ten minutes. Those who were unable to answer the questions by phone were interviewed in their hospitals or COVID-19 centers if possible.

Study Instrument

A questionnaire in Arabic was modified and developed based on the study's aim and objectives and its conceptual framework. The smoking status section was adopted from the WHO Stepwise questionnaire with minor modifications to align with the study factors. It consisted of the following parts: socio-demographic data, smoking status, seasonal flu, medical history of PCR COVID-19, and the experience of COVID-19 cases. The questionnaire took approximately 10 minutes to complete.

Pilot study of the questionnaire

The questionnaire was validated and piloted after its development. The pilot study involved 16 COVID-19 patients and was validated by 8 experts in epidemiology, scientific research, and public health. The reliability for different sections ranged between 72.0 and 92.0.

Data Analysis

Both analytical and descriptive analyses were performed. Descriptive statistics were used to display frequencies and percentages for categorical variables, as well as means and standard deviations for continuous variables. The Chi-square test and multivariate analysis utilized binary logistic regression (Enter Model). Our primary measure of association was the Adjusted Odds Ratios (AORs) with 95% confidence intervals (95% CI). P-values less than 0.05 were considered significant.

Ethical consideration

Ethical approval was obtained from the Al Quds University Ethical Research Committee (REC). Additional ethical approval and consent to conduct the study were obtained from the Palestinian Ministry of Health. The consent form was signed by the participants.

RESULTS

Our study comprised 338 participants (169 cases and 169 controls) with a 95% response rate. Most of our participants (46.4%) were living in the northern region (Nablus, Jenin, Qalqilya, Salfit, Tubas, Tulkarm), and 60.7% were married. The mean age was 38 years (the youngest was 14 years old, and the oldest was 84 years).

Most participants' blood group was "O" (37.9%), followed by "A" (36.7%); 13.6% had blood group "B," and 11.8% had blood group "AB." Regarding the rhesus factor (RH), the majority of participants were RH positive (80.2%), while 19.8% were RH negative. Univariate analysis revealed no statistically significant difference between the cases and controls according to sociodemographic characteristics except for the blood group (P.value <0.05), as shown in Table 1.

ABO Blood group and the severity of COVID-19

The study revealed no significant difference between the ABO blood group and the severity of symptoms or the duration of symptoms. Additionally, the results showed no association between the ABO blood group and the outcome of COVID-19 (P > 0.05), as shown in Table 2.

Multivariate analysis

Multivariate analysis showed significant differences between blood group "A" and other blood groups. Based on AOR and CI, the results showed that blood group "B" is more protective against COVID-19 (AOR= 0.40, CI= 0.223-0.27). There was also a significant difference between blood groups "A" and "AB," with "AB" being more protective against COVID-19 by 31.6% (P <0.05, AOR= 0.316, CI= 0.143-0.698).

Table 1: Univariate analysis for cases and controls according to their characteristics

Variables		Cases (N%)	Controls (N%)	P value
Sex	Male	86 (50.9%)	88 (52.1%)	0.828
	Female	83 (49.1%)	81 (47.9%)	
Area of residence	Northern West Bank**	78 (46.2%)	79 (46.7%)	0.991
	Southern West Bank***	48 (28.4%)	48 (28.4%)	
	Middle West Bank****	43 (25.4%)	42 (42.9%)	
Blood group	A	72 (42.6%)	52 (30.8%)	**0.019***
	B	27 (16%)	19 (11.2%)	
	AB	19 (11.2%)	21 (12.4%)	
	O	51 (30.2%)	77 (45.6%)	
Rhesus factor	Positive	137 (81.1%)	134 (79.3%)	0.682
	Negative	32 (18.9%)	35 (20.7%)	
Body Mass Index	<18 Underweight	6 (3.6%)	3 (1.8%)	0.739
	18-24.9 Normal	74 (43.8%)	72 (42.6%)	
	25-29.9 Overweight	55 (32.5%)	56 (33.1%)	
	>30 Obesity	34 (20.1%)	38 (22.5%)	
Marital status	Single	51 (30.2%)	63 (37.3%)	0.343
	Married	109 (64.5%)	96 (56.8%)	
	Divorced or widowed	9 (5.3%)	10 (5.9%)	
Occupation	Health Worker	12 (7.1%)	21 (12.4%)	0.132
	Non-Health employee	82 (48.5%)	87 (51.5%)	
	Unemployed	75 (4.4%)	61 (36.1%)	
Chronic Diseases	Yes	37 (21.9%)	36 (21.3%)	0.895
	No	132 (78.1%)	133 (78.7%)	
Smoking status				
Smoking	Yes	50(29.6%)	75(44.4%)	0.005
	No	119(70.4%)	94(55.6%)	
Current smoker	Yes	47(27.8%)	65(38.5%)	0.038
	No	122(72.2%)	104(61.5%)	
Age of smoking initiation	< 18 years	26(15.4%)	40(23.7%)	0.019
	≥ 18 years	24(14.2%)	35(20.7%)	
Flu Vaccination				
In past years, did you get the flu vaccination?	Yes	39(23.1%)	58(34.3%)	0.022
	No	130(76.9%)	111(65.7%)	
COVID-19 PCR test				
How many times have you done this test?	< 3 times	118(69.8%)	91(53.8%)	0.003
	≥ 3 times	51(30.2%)	78(46.2%)	
In the last Test, was there a need for a re-test?	Yes	29(17.2%)	55(32.5%)	0.001
	No	140(82.8%)	114(67.5%)	

*Significant value (P<0.05), **Northern West Bank: Nablus, Jenin, Qalqilya, Salfeet, Tubas, Tulkarem, ***Southern West Bank: Bethlehem, Hebron, ****Middle West Bank: Ramallah, Jericho, Jerusalem

Table2: Severity of COVID-19 among cases in Palestine

Variables		A	B	AB	O	P. Value
Severity of Symptoms	Mild*	36 (29.0%)	15(32.6%)	11(27.5%)	28(21.9%)	0.317
	Moderate**	15(12.1%)	3(6.5%)	3(7.5%)	14(10.9%)	
	Severe***	5(4.0%)	3(6.5%)	0(0.0%)	4(3.1%)	
	Critical***	12(9.7%)	6(13.0%)	5(12.5%)	6(4.7%)	
The duration of symptoms (days)	< 7days	21(16.9%)	8(17.4%)	4(10.0%)	16(12.5%)	0.154
	≥ 7 days	50(40.3%)	19(41.3%)	16(40.0%)	36(28.1%)	
Oxygen therapy		17 (13.7%)	9(19.6%)	5(12.5%)	9(7.0%)	0.117
Mechanical Ventilation		9(7.3%)	6(13.0%)	3(7.5%)	4(3.1%)	0.121
Duration on Mechanical Ventilation (days)	< 7days	1(0.8%)	2(4.3%)	0(0.0%)	1(0.8%)	0.108
	≥ 7 days	8(6.5%)	4(8.7%)	3(7.5%)	2(1.6%)	

On the other hand, there is no statistically significant difference between blood group A and blood group O ($P > 0.05$, AOR = 0.843, CI = 0.382-1.863), which revealed that blood group O is 0.84 times more protective than blood group A. Smoking showed no significant differences between smokers and nonsmokers ($P > 0.5$). Additionally, the study showed that not being vaccinated for seasonal flu increases the risk of COVID-19 infection by 1.97 times compared to people who get vaccinated, as shown in Table 3.

DISCUSSION

Study Participant's Characteristics and Blood Group Type with Risk of COVID-19

This section includes participants' sociodemographic factors, smoking status, BMI, occupational exposure, and seasonal flu experience. We calculated unadjusted odds ratios for each variable, which showed no significant differences except for age, which was identified as a confounder. The results showed no significant difference between cases and controls in risk of COVID-19 according to gender ($P = 0.828 > 0.05$). This result is consistent with studies from Egypt, Saudi Arabia, China, Italy, Spain, France, Germany, and Switzerland [1, 3, 11]. Few studies have examined the interaction between gender, blood type, and the severity of COVID-19, and we highlighted this aspect to explore its potential as a confounder.

Blood group

In our multivariate analysis, we compared blood group A versus other blood groups. The results showed that blood group AB (0.4%) and blood group B (0.2%) were more protective, while there was no significant difference between blood group O and blood group A (CI = 0.382-1.863, AOR = 0.843). This finding is consistent with a case-control study conducted among 105 cases and 103 controls in Wuhan, which found a significant difference between blood group and the risk of infection with COVID-19, particularly among females with blood group A [12].

Conversely, a retrospective cross-sectional study conducted in Saudi Arabia and Egypt found an insignificant difference in the distribution of blood group A between cases and controls (35% versus 29%, respectively) and no significant difference in RH factor distribution ($P = 0.191$) [3]. This discrepancy could be attributed to differences in sample size, study design, and the geographical distribution of blood groups.

Table 3: Multivariate Forward non conditional model analysis of the associated variables with COVID-19

Variables		Sig	AOR**	95% C.I.***	
				Lower	Upper
Blood group	A	.003			
	B	.002	.400	.223	.720
	AB	.004	.316	.143	.698
	O	.673	.843	.382	1.863
Smoking	Yes	Ref.****	Ref.	Ref.	Ref
	No	.493	.545	.096	3.100
Current smoker	Yes	Ref.	Ref.	Ref.	Ref
	No	.180	.379	.092	1.566
Age of smoking initiation	< 18 years	.055			
	≥ 18 years	.064	6.109	.898	41.575
Receiving flu vaccination?	Yes	Ref.	Ref.	Ref.	Ref
	No	.019	1.974	1.119	3.483
How many times have you done this test?	< 3 times	Ref.	Ref.	Ref.	Ref
	≥ 3 times	.023	.531	.308	.916
In the last Test, was there a need for a re-test to confirm the result?	Yes	Ref.	Ref.	Ref.	Ref
	No	.098	1.679	.909	3.102

All variables that were significant ($P < 0.05$) in univariate analysis were included in a multivariate model: i.e., Blood group, Smoking, current smoker, Flu vaccination **Adjusted odds ratio. ***Confidence interval. ****Ref: Reference.

The role of blood group on COVID-19 susceptibility may be related to the differential aggregation of virus glycoprotein receptors on host cell surfaces, which is influenced by ABO(H) determinants via carbohydrate-carbohydrate interactions with these receptors' glycan motifs. This interaction may interfere with virus binding and entry into target cells [13]. Other cells and tissues, such as lymphocytes, endothelial cells, platelets, gastric mucosa, and bone marrow, also express ABO(H) blood group carbohydrate structures, not just red blood cells [14]. Furthermore, blood type antigens may be present in the secretions (saliva) of approximately 80% of people (ABO secretors) [14].

Regarding the rhesus factor, our study showed no significant difference between cases and controls, similar to findings from a retrospective cohort study in Denmark, which found a significant difference between blood group and risk for COVID-19 but no significant difference between blood group or Rh factor and hospitalization outcome or death [15]. Conversely, a case-control study

conducted on 5668 COVID-19 patients and 5668 controls in Iraq demonstrated that individuals with negative RH are more susceptible to COVID-19 than those with positive RH blood type (OR = 2.38, 95% CI [2.03, 2.79], P = 0.0001) [16]. Additionally, a study in Canada concluded that the Rhesus-negative (Rh−) blood type was slightly protective against COVID-19, particularly for those with O-negative blood (aRR, 0.74 [CI, 0.66 to 0.83]; ARD, −8.2 per 1000 [CI, −10.8 to −5.3]) [17]. These differences could be attributed to variations in sample size and Rh factor distribution among countries, as the Rh-negative factor is rare in Palestine.

The following factors were assessed to determine whether they were confounding variables, but the results showed no association with the COVID-19 outcome, indicating they were not confounders in our study. No significant difference was observed between COVID-19 patients regarding their BMI, which aligns with a study conducted on 1067 patients in Southeast Asia [18]. Furthermore, no genome-wide association studies have shown that other genes linked to higher BMI are situated in the same chromosomal area as ABO, or that the ABO gene exerts regulatory control over them [18]. Therefore, it is reasonable to conclude that there is insufficient genetic evidence to link ABO to BMI. The various findings addressing the link between ABO/Rh status and BMI may be influenced by local variables that alter population phenotype or changes in sample size rather than a true genetic impact [18].

Regarding flu, our study showed no significant difference between cases and controls according to their past seasonal flu experience. However, there was a significant difference between cases and controls among those who had received a flu vaccine previously ($P < 0.05$), except for the current year. On the other hand, new evidence from a study conducted by researchers in London suggests that people who currently smoke may be less likely to get infected with coronavirus. One study found that nicotine inhibits the virus's ability to enter cells by interfering with ACE2 receptors [19].

This contrasts with a study conducted on over 2.4 million participants, which showed that current smokers were more likely to report symptoms indicative of a COVID-19 diagnosis. The adjusted odds ratios (OR) for classic symptoms were 1.14 (95% CI, 1.10 to 1.18), for more than 5 symptoms were 1.29 (95% CI, 1.26 to 1.31), and for more than 10 symptoms were 1.50 (95% CI, 1.42 to 1.58) [20]. The study suggested that smoking is linked to the overexpression of ACE2, the receptor for SARS-CoV-2 in the lungs. However, a recent meta-analysis shows mixed effects, with upregulation in epithelial cells and downregulation in alveolar type 2 cells. Internalization of ACE2 due to viral infection may result in unopposed ACE inhibitor action and high angiotensin 2 levels, contributing to endothelial damage and the coagulopathy and microthrombosis seen in severe COVID-19 patients [20, 21]. These variations in results may be due to the distribution of smokers among cases and controls, which is related to the small sample size.

Association between ABO blood group and the Severity of Symptoms

Our study results showed that the most critical symptoms were among blood group B, and the highest distribution of moderate symptoms was also among blood group B. Despite this, there is no association between ABO blood group and the severity of symptoms, which corresponds with findings from a study involving 227 COVID-19 patients. The study showed that the risk of severe COVID-19 infection did not differ significantly according to ABO blood types [22]. Conversely, a retrospective cross-sectional study conducted in Egypt and Saudi Arabia indicated a significant difference between cases and controls regarding the risk for COVID-19 but not for symptoms like fever, headache, shortness of breath, cough, bone ache, gastrointestinal symptoms, and hospitalization.

Our findings are similar to a case-control study conducted in Utah, Idaho, and Nevada, which adjusted for age, gender,

and RH factor, showing no association between blood group and the risk or severity of symptoms [23, 24]. On the other hand, there was a statistically significant difference between blood groups and the need for mechanical ventilation, myalgia, and the recovery time from COVID-19. Blood group A showed the highest percentage of individuals with low oxygen saturation, while no one in blood group B experienced low oxygen saturation. Blood group O had the highest percentage of individuals requiring mechanical ventilation, with no one in blood group A needing it [3]. These differences could be attributed to variations in sample size and blood group distribution.

Association between ABO blood group and COVID-19 outcomes

Our study revealed no significant difference between ABO blood group and COVID-19 outcomes, including intubation, need for intensive care unit admission, need for oxygen therapy, or complications. This is consistent with a study conducted in five major hospitals in Massachusetts from March to April, involving 7648 patients. The results showed that 37.5% were admitted to the hospital, 9.5% were admitted to the ICU, 8.4% were intubated, and 6.9% died. Among these patients, 34.2% had blood group A, 15.6% had blood group B, 4.7% had blood group AB, and 45.5% had blood group O. The researchers found no association between ABO blood type and COVID-19 disease severity, defined as intubation or death, with blood type O having the lowest frequency of disease positivity [25].

In contrast, a case-control study conducted among 179 patients with confirmed COVID-19 and 5200 healthy control patients in Turkey showed that blood group A was the most common among COVID-19 cases compared to the control group. It also found that patients with blood group A had longer ICU stays and higher mortality rates than others [26]. An ecological study conducted among 86 Asian, European, African, and American populations showed that blood groups A, B, and Rh- were significantly associated with COVID-19, with blood group A- having the most serious outcomes and hospitalization rates [27, 28].

Furthermore, the outcomes of this study, as well as the few other publications in this sector, indicate a wide range of data, making a conclusion about a link between blood type and COVID-19 challenging. This discrepancy in data might imply the presence of some unknown underlying factor rather than the blood group or type of antibodies present.

Study Strengths and Limitations

One of the few studies conducted in Palestine employed a case-control study design and included multiple variables, which might act as confounders. It effectively measured the risk of COVID-19 infection, the severity of symptoms, and the outcomes of infection using a valid and reliable study tool.

Regarding study limitations, there were constraints such as limited resources and scant previous research on ABO groups and COVID-19, as well as limited financial support. There was also the potential for recall bias in recalling specific symptom severities. Furthermore, misclassification of cases and controls due to false-negative or false-positive results was possible, and there were challenges in matching related to limited resources concerning potential confounders. Additionally, the study faced restrictions due to lockdown measures.

CONCLUSION

The study conducted in Palestine has identified a possible association between ABO blood group and COVID-19. Specifically, blood group “A” was found to increase the risk of COVID-19 infection. However, no association was observed regarding the severity of COVID-19 symptoms. Nevertheless, the exact mechanism and the extent of this effect varied, highlighting the need for larger and more rigorously controlled studies to investigate further.

This public health study underscores the potential influence of blood types on the transmission and infection of

individuals with the COVID-19 virus. Understanding these factors can enhance our knowledge of virus transmission dynamics and aid in developing targeted preventive measures and public health interventions to mitigate the spread of the epidemic and reduce infection rates.

Author Contributions

MK and AO: conceptualization of study and its design; AO, data collection and curation; MK and AO: data analysis and interpretation; MK and AO. Initial draft of manuscript; MK and AO: critical revision of final manuscript; MK and AO.: final approval of manuscript.

Data Availability Statement

All data collected and analyzed for this study have been deposited at the Drug

Information Library of the Department of Clinical Pharmacy, Al-Quds University. Any reader seeking to have access to these data should send a mail to the corresponding author.

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Conflict of Interest

The authors have no interest related to this study to declare.

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العلاقة بين نظام فصيلة الدم ABO وخطورة فيروس كورونا في الضفة الغربية: دراسة الحالات والشواهد

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ملخص

مقدمة: فحصت العديد من الدراسات عوامل الخطر لكوفيد-19 وكان هناك تعارض بين نتائج وتقارير الباحثين حول ما إذا كان لنوع فصيلة الدم دور في التأثير على خطر كوفيد-19. لذلك ، هدفت هذه الدراسة إلى تحديد العلاقة بين نظام فصيلة دم أبو وشدة كوفيد -19 في الضفة الغربية في فلسطين.

منهجية الدارسة: تألف تصميم دراسة الحالات والشواهد من (169 حالة و 169 عنصر تحكم) الذين اختبروا كوفيد-19 خلال شهر مارس/آذار 2021 في الضفة الغربية ، طبقية وفقا لنتائج الاختبار. تم استخدام استبيان ذاتي الإدارة لجمع البيانات وتم ملؤه عن طريق الاتصال بالمشاركين عبر أرقام هواتفهم. للتحليل ، تم إجراء التحليلات الوصفية والتحليلية. الانحدار اللوجستي الثنائي (أدخل النموذج) في التحليل متعدد المتغيرات لإثبات نسبة الأرجحية.

النتائج: فصيلة الدم ب أكثر حماية ضد كوفيد -19 من "أAB" .(AOR= 0.40, CI= 0.223-0.27) " هو أكثر حماية تجاه كوفيد -19 أكثر من"A أ .(AOR= 0.316, CI= 0.143-0.698, P < 0.5) " لا يوجد فرق ذو دلالة إحصائية بين فصيلة الدم أ وفصيلة الدم " س " و شدة الأعراض أو النتائج المركبة لكوفيد-19.

الاستنتاج: هناك ارتباط بين فصيلة دم ABO وخطر الإصابة بكوفيد-19. ومع ذلك ، اختلفت الآلية الدقيقة وشدة التأثير مما استلزم مزيدا من التحقيق من خلال دراسات أكبر وأكثر كثافة.

الكلمات الدالة: فلسطين، كوفيد-19، فصيلة الدم، شدة الاعراض.

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