The Effect ABO Blood Groups On Severity Coronavirus Disease Clinical Symptoms

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Abstract: Coronavirus disease 2019 is a new respiratory disease that spreads rapidly caused severe acute respiratory syndrome coronavirus-2 where the severity of symptoms varies from person to person according to different factors, including blood group type. In this study, we investigate the effect of different blood groups type (A, B, AB, and O) on the different severity of clinical outcomes in COVID-19 patients and the risk of SARS-CoV-2 infection. with 100 patients from The initial monitoring and rapid response center for the Corona epidemic - Al-Bayda, were confirmed covid-19 positive by RT-PCR, the different clinical symptoms and blood groups type were questioned and investigated and we have used Analytic to statistics SPSS T.test, we absorption a relationship between the severity of symptoms with the different blood group A, B, AB, and O 48%, 13%, 3%, and 37%, respectively.

Keywords:coronavirus , ABO blood group , clinical outcome , COVID-19.

INTRODUCTION:

Coronavirus disease 2019 COVID-19 was the first case discovered in Wuhan in the late part of 2019. The virus was classified as dangerous and caused death , the World Health Organization in February 2020 called is COVID-19. on March 2020 The world health organization namedCOVID-19 infection that caused by coronavirus 2 SARS-CoV-2 as pandemic where causesSevere acute respiratory syndrome. The initial symptoms are fever, cough, and fatigue were diagnosed with a novel coronavirus disease.(Göker et al. 2020)There are factors that increase clinical severity such as obesity, history of smoking, and respiratory diseases, also the genetic factors will prove to be relevant to theinflammatory response. ABO blood types are carbohydrate receptor that are present on the surface of human cells. The antigenic determinants of A and B blood groups are tri-saccharide moieties GalNAcα1-3-(Fucα1,2)-Galβ- and Galα1-3-(Fucα1,2)-Galβ-, while O blood group antigen is Fucα1,2-Galβ-. While blood types are genetically inherited, the environment factors can potentially influence which blood types in a population will be passed on more frequently to the next generation.(Fan et al. 2020).There are some clinical studies examining the relationship between infection risk and the body types and the blood groups. The studies were demonstrated that blood group O had a negative predictive effect, also clinical outcome were several compared with A groupthat was more frequent in patients who presented with severe pulmonary damage. (Dziket al. 2020;Daiet al. 2020). Here, we   The investigate the

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distribution and relationship between ABO blood group, where the aim of this study is the investigation of the relationship between ABO blood group to COVID-19 patients and their clinical outcomes at Health Center of Al- Beyda.

MATERIALS AND METHODS:

The study included 100 patients with PCR confirmed diagnosis of COVID-19 with severe clinical symptoms who were   the followed at the Health Center of Al- Beyda randomly between November, 2020 toDecember, 2020 of different ABO blood group different sex males and females, the ages where between 25 to 80 years included in this study. Clinical symptoms data including cough, fever, loss of taste or smell, whether there is vomiting or diarrhea, history of shortening of breathing (S.O.B) and acute respiratory distress syndrome (ARDS), runny and nose, D.dimer level, transferred to hospital and outcome of the patients were obtained from them.

Statistical Analysis:

The data from hundred patients were analyzed using the Statistical Package for Social Sciences (SPSS) version 22). One way ANOVA test was performed to determine the significant differences between the means. For Comparisons between the blood groups, chi-square tests were used. P values < 0.05 were considered statistically significant.

RESULTS:

The ABO blood group from 100 patients infected with COVID-19 was tested, with a distribution of A, B, AB, and O being 48%, 13%, 3%, and 37%, respectively. Individuals with blood group A had a higher risk of infection compared with those of blood group B, AB, and O. The proportion of blood group A in patients with COVID-19 was significantly higher than that in GROUP B AND AB, $(P < 0.001)$.
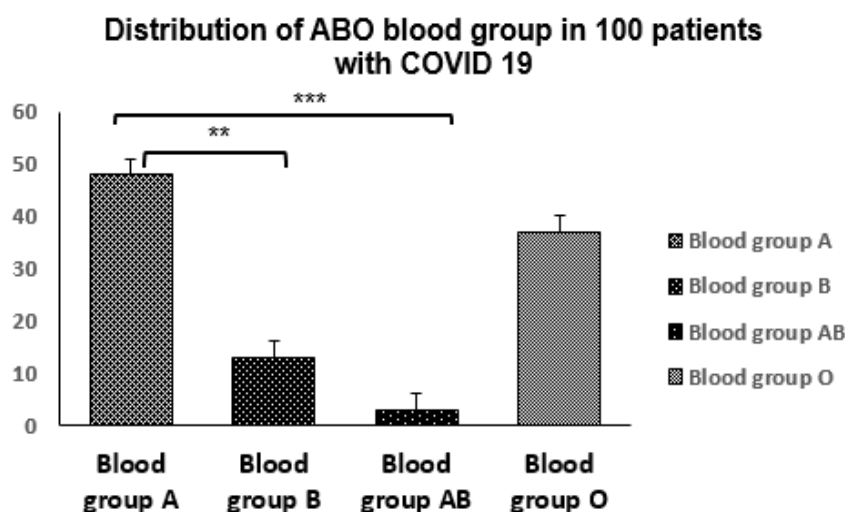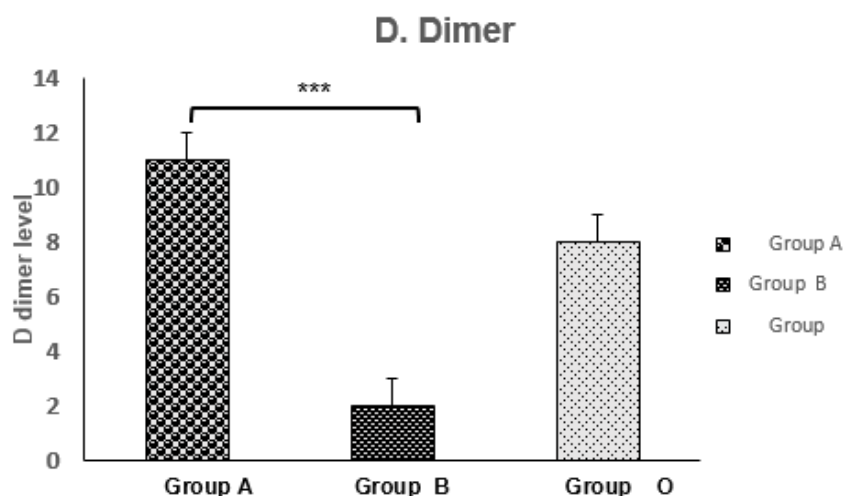

Distribution of ABO blood group in 100 patients with COVID 19

Figure: (1). Distribution of ABO blood group in 1oo patients with COVID 19.

Figure: (2)._D-dimer_ levels were _significantly higher_ in blood group A than in the B blood group. While, _there_ is _nosignificant difference between_ the means _of_thetwo populations A and O.

The effect of blood groups on clinical distribution outcomes of COVID-19 patients are presented in Table 1. As shown in the table, there were significant effect of ABO demonstrated on fever and cough. However, there were no significant effect of specific ABO blood groups were demonstrated on the loss of smell, ARDS and vomiting.The effect of blood groups on clinical outcomes of COVID-19 patients are presented in Table 1. There were significant effect of ABO groups demonstrated on fever and cough. However, in case of the loss of smell, ARDS and vomiting. A statically significant effect of ABO group were not established.

DISCUSSION:

In fact, a number of epidemiological studies had also been conducted. For instance, the study of (Li et al. 2020), reported that the proportion of blood type A in patients infected with SARS-CoV-2 was significantly higher than that in healthy controls (0.38 vs. 0.32%, P <0.001), while the proportion of blood type O in SARSCoV-2 infected patients was significantly lower than in healthy controls (0.26 vs. 0.34%, P < 0.001) (Li et al., 2020). In another study, Zhao et al. also showed that blood type A was associated with an increased risk of SARS-CoV-2 infection, whereas blood type O was associated with a decreased risk (Gerard et al., 2020; Zhao et al., 2020). The main finding of our study was consistent with the above analysis by Li et al. and Zhao et al., but slightly different. These findings are consistent with similar risk patterns of ABO blood groups for other coronavirus infections found in previous studies. For example,(Cheng et al 2020). reported that the SARS-CoV infection susceptibility in Hong Kong was differentiated by the ABO blood group systems. The authors found that compared with non-O blood group hospital staff, blood group O hospital staff had a lower chance of getting infected. (Patrice et al. 2020).ABO antibodies are part of the innate immune system against some parasites, bacteria and enveloped viruses, and HBGAs are important as receptors for immune and inflammatory responses (Jing et al., 2020).In the current study, we aimed to evaluate the contribution of The ABO blood group to COVID-19 susceptibility in Wuhan by employing a case-control association analysis.(Ali et al. 2020).

Table:(1).Relationships between COVID-19 clinical symptoms and different blood groups.

Clinical symptoms	Group A (N= 48) n (%)	Group B (N= 13) n (%)	Group AB (N= 3) n (%)	Group O (N= 37) n (%)	p-value
Fever	27 (56.3)	8 (61.5)	3 (100)	17 (45.9)	0.04
Cough	45 (93.8)	9 (69.2)	3 (100)	21 (56.8)	0.001
SOB	35 (72.9)	3 (23.7)	3 (100)	20 (54)	1.3
Loss of Smell	12 (25)	5 (38.5)	0	16 (43)	4.3
ARDS	10 (20.8)	2 (15.3)	0	0	6.07
Vomiting	11 (22.9)	6 (46.2)	0	16 (43)	3.8

CONCLUSION:

In this study, we found that ABO blood groups displayed different association risks for the infection with SARS-CoV-2 resulting in COVID-19. Specifically, blood group A was associated with an increased risk whereas blood group O was associated with a decreased risk, thus demonstrating that the ABO blood type is a biomarker for differential susceptibility of COVID-19.

APPRECIATION:

المستخلص : مرض كورونا 2019 هو مرض رئوي جديد حيث ينتشر بسرعة مسببا متلازمة الجهاز التنفسي الشديدة الحادة النوع 2 حيث تختلف شدة الاعراض من شخص لأخر حسب عوامل مختلفة تشمل مجموعات فصائل الدم. في هذه الدراسة يتم التحقق في تأثير اختلاف بمجموعات فصائل الدم (أ، ب، أ ب، و) مع اختلاف شدة الاعراض السريرية لمصابي فيروس كورونا وخطورة عدوى الفيروس. مع 100 مصاب من المترددين على مركز الرصد الاولي والاستجابة السريعة البيضاء، تم التأكد من اصابتهم بواسطة (تفاعل البوليمرز المتسلسل) و التحقق من اعراضهم بالسؤال عنها تم تحليل البيانات باستخدام التحليل الاحصائي برنامج (الحزمة الاحصائية للعلوم الاجتماعية) ، لاحظنا وجود علاقة بين شدة الاعراض باختلاف مجموعات فصائل الدم (أ ، ب ، أ ب ، و) 48%، 13%، 3% و 37% على التوالي .

الكلمات المفتاحية: كورونا فيروس، فصائل الدم، الاعراض السريرية، كوفيد–19.

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