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RESEARCH ARTICLE

COVID 19 & BLOOD GROUPS, ARE THEY LINKED: A TERTIARY CARE CENTER STUDY AT INDORE, MADHYA PRADESH, INDIA

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ABSTRACT

Background: Novel coronavirus, which is the main etiological agent of Covid-19 (corona virus diseases 2019), appeared in Wuhan, China. Novel coronavirus is officially recognized as SARS CoV-2 (severe acute respiratory syndrome corona virus 2). The motive of the present study is to check whether there is any link exist between blood group and Covid-19. **Material and Method:** A total of 537 patients participated in the present study. Out of these, males were 318 in number and females were 219. Intravenous blood is taken for blood group examination. **Result:** The most common blood group affected by COVID 19 in both male and female was blood group B **Conclusion:** Persons having blood group B has more chances of occurring of Covid-19.

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INTRODUCTION

Blood group plays an important and crucial role in transfusion medicine and is determined genetically. The ABO blood grouping system is mainly established on the basis of red blood cells antigenic property. The ABO blood grouping system consists of 4 blood group types that is A, B, AB and O (Ganong, 2005). It is a well known fact that persons having blood group A show presence of antigen A, blood group B individuals show presence of antigen B and persons having blood group AB show presence of both antigen A and antigen B, but persons having blood group O does not contain either antigen A or antigen B. The antigen A and antigen B are present on red blood cell surface and are complex oligosaccharides (Schleef, 2004). The Rh system was discovered by Landsteiner and Wiener.

On the basis of this Rh antigen, blood is divided into Rh positive and Rh negative. If Rh antigen is present, it is called Rh positive and if Rh antigen absent, it is called as Rh negative (Smita, 2013; Roy, 2011). In various researches, it is observed that ABO blood groups are correlated with various diseases like diabetes mellitus, gastric cancer, duodenal ulcer, venous thrombosis as well as urinary tract infection (Zhang, 2012; Wiggins, 2008). Since long researchers have tried to find an association between various diseases & blood groups. In keeping with this line of thinking an attempt has been made through this study to determine whether the SARS-COV2 Virus has a predilection for any specific blood group and also whether the severity of the disease also has some link with an individual's blood group. The SARS-COV2 2019 belongs to Corona virus family which usually causes a variety of symptoms like fever, difficulty in breathing, pneumonia as well as lung infection in patients. The official name Corona virus disease (Covid-19) was announced by WHO (World Health Organization) (Wang, 2020), SARS-COV2 2019 is an RNA virus which is well enveloped. The diameter of SARS-COV2 is approximately 60 nm to 140 nm and shows various spike

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like projections present on the surface and it gives a crown like presentation under electron microscope (Fehr, 2017). A lot of researches are being done on the corona virus, but very few studies have been done that have attempted to establish co-relation between the blood group and COVID 19.

MATERIALS AND METHODS

Present study was carried out at Index Medical College, Hospital and Research Center, Indore, Madhya Pradesh. A written informed consent was taken for the study from the patient. A total number of 537 patients participated in the present study. Out of these, males were 318 (59 %) in number and females were 219 (41 %) in number. Intravenous blood sample taken for other laboratory procedures was used for ascertaining the blood group. To determine the blood group of the corona affected patients, antisera is used (Figure 1). After mixing the appropriate amount of blood in the antisera, it was checked for presence or absence of agglutination in each slide (Figure 2). For accurate results and to avoid any conflicts regarding the results of blood group, three operators are assigned to check the slides individually.



Figure 1. Antisera used for determining the ABO blood group

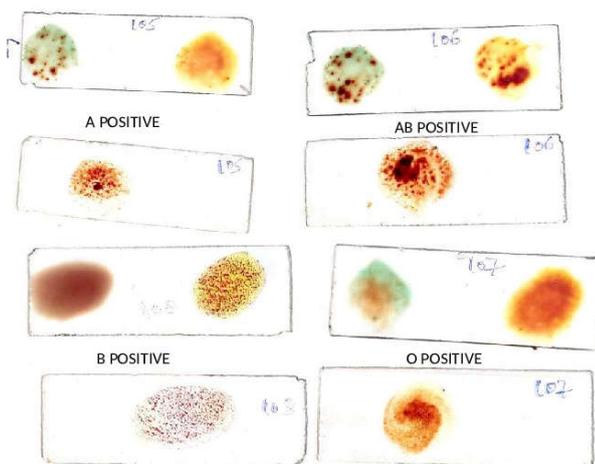


Figure 2. Blood grouping (A,B,AB,O)

RESULTS

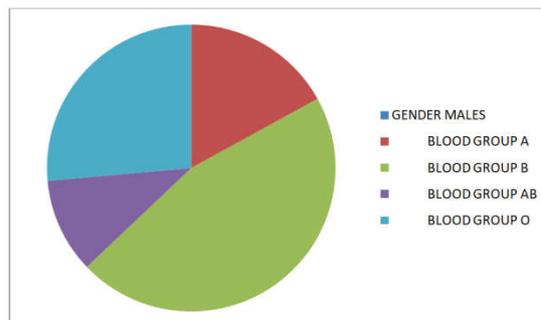
A total number of 537 patients were included in the present study. The blood group analysis of all the patients samples was done in the pathology laboratory of our institute. In our study, we found that in males, the most common blood group affected by COVID 19 was blood group B (46%) which is followed by blood group O (26%), blood group A (17%)

Table 1. most common blood group affected by corona virus in male

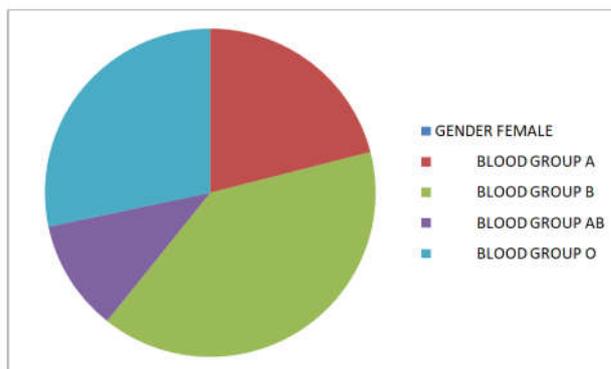
GENDER	BLOOD GROUP			
	A	B	AB	O
MALES	54	146	34	84

Table 2 . Most common blood group affected by corona virus in female

GENDER	BLOOD GROUP			
	A	B	AB	O
FEMALE	46	87	24	62



Graph 1. Blood Group Affected By Corona Virus In Male



Graph 2. blood group affected by corona virus in female

and blood group AB (11%) (Table 1). In females, the most common blood group affected by COVID19 was blood group B (40%) which is followed by blood group O (28%), blood group A (21%) and blood group AB (11 %) (Table 2). On analyzing the result we found that overall, blood group B in both males and females are the most common affected blood group by COVID 19 (Graph 1 and Graph 2).

DISCUSSION

The ABO blood group system was discovered by Karl Landsteiner, an Australian scientist. He observed three blood groups in the year 1900 and was awarded by the nobel prize in the year 1930 for this important work. The fourth type of blood group i.e. AB blood group was discovered by two scientists Alfred von Decastello and Adriano Sturli in the year 1902 (Speiser, 1975). Landsteiner demonstrated the reactions which occur between the red blood cells and serum. These reactions were directly related to the companionship of the antigens present on the red blood cells and antibodies present in the serum.

When the red blood cells antigens encountered the antibodies present in the serum, agglutination occurred. The expression of antigen A and antigen B decides whether the blood group is A or B. In the blood group AB, both antigen A and antigen B are expressed. Blood group O lacks both antigen A and antigen B. The ABO locus consists of three important allelic forms i.e. A, B and O. The A allele revealed a Glycosyltransferase which develops A antigen and the B allele revealed Glycosyltransferase that produces B antigen (Stayboldt, 1987; Reid, 1990). In the present study, we are trying to see whether there is any co-relation between the ABO blood group system and COVID 19. Our study consists of 537 patients. Out of 537 patients, 318 were males (59 %) and 219 (41 %) were females. After data analysis, we have observed that in males, the most common blood group affected by COVID19 is blood group B (46%) which is followed by blood group O (26%), blood group A (17%) and blood group AB (11%). Similarly, in females, the most common blood group affected by corona virus is blood group B (40 %) which is followed by blood group O (28%), blood group A (21%) and blood group AB (11 %). Till now no study had been done in India regarding the association of ABO blood group system and COVID19. In our study, we are bound by some limitations like our data is limited to a specific geographical location, absence of data for comparison. So, more number of studies should be done in different geographical locations to get more data. We found that people with blood group B are more susceptible for getting infection with COVID19.

Conclusion

The present study reveals that the likelihood of getting infected with COVID- 19 is maximum in people having B blood group while the subjects of blood group AB are the least likely to be infected. However much more work needs to be done before any concrete conclusions are drawn. But the significance of present study lies in the fact that acting on this assumed linkage at least some preventive measures can be modified depending on the group of the patient.

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