Original Article

FREQUENCY OF BLOOD GROUPS AND DURATION OF HOSPITAL STAY AMONG DIFFERENT BLOOD GROUPS IN COVID-19 PATIENTS

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ABSTRACT:
COVID-19 pandemic is the greatest global challenge, the world is facing from the past few months. Pakistan is currently going through this ongoing health crisis that is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This virus, named as coronavirus disease (Covid-19), specifically acts on angiotensin-converting enzyme, which was widely found in vascular endothelium, respiratory epithelium, alveolar monocytes, and macrophages. It is reported that there is an unusual trend of abrupt inflammation and hypercoagulability in critically ill COVID-19 patients.
Antigenic expression of different blood groups are linked with the development of certain infections. Several blood groups play an important role in the modification of immune response and by providing receptors for microorganisms. Recently, researchers have reported a strong association of COVID-19 disease and certain blood groups.
Objective: To determine the frequency of ABO blood group and its association with the duration of hospital stay in the hospital in COVID -19 patients.
Material and Methods: This was a retrospective study analyzing the ABO blood group distribution in 150 patients of COVID-19 admitted in the corona unit of Farooq hospital Westwood branch Lahore from 1st May 2020 to 30th June 2020. These admitted cases were confirmed by RT-PCR.
Results: The results showed that among COVID-19 patients, blood group B (40%) was more common as compared to O (21%) blood group. Most of the patients (61%) with blood group A required prolonged hospital stay (≥7 days) than patients with blood group O (42%).
Conclusion: We concluded that certain blood group types have a strong association with developing COVID-19 disease.

Key Words: COVID-19, Macrophages, Monocytes, Vascular Endothelium

INTRODUCTION:

The coronavirus (COVID-19) is a major concern all over the world these days. As this is a new virus attacking humans, less is known about it. Researchers from all over the world are working diligently to find out ways to understand its pathogenesis and risk factors to improve management of the patients. World Health Organization designated severe acute respiratory syndrome coronavirus-2 (SARS COV-2) as COVID-19.[1]

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This single-stranded RNA virus shows the tropism for angiotensin-converting enzyme receptors on respiratory epithelium leading to widespread inflammatory response and systemic coagulopathy in severe cases.[2]

A number of studies have shown an association between host susceptibility to infections and different blood groups.[3] ABO groups denote the presence of carbohydrate antigens present on glycosphingolipids and glycoproteins on RBCs and a wide variety of human tissues.[4] Walls A et al studied the structure, function, and antigenicity of the SARS-CoV-2 spike glycoprotein. The SARS-COV spike (S) protein is a glycoprotein with potential N-glycosylation sites.[5]

A study published on data from Wuhan (China) revealed that people with blood

group A are at a higher risk for Coronavirus infection as compared to people with blood group O. The susceptibility of low-risk blood group and high-risk blood group could be attributed to certain natural group-specific antibodies.[6]

The results from another study conducted in New York also revealed positive linkage between different ABO groups and COVID-19 disease.[7] The present study was conducted to assess the frequency and association of different blood groups with a hospital stay in COVID-19 patients admitted to Farooq Hospital Westwood.

MATERIAL AND METHODS:

Demographic and blood group data were collected retrospectively from COVID -19 patients admitted in the Corona Unit of Farooq Hospital Westwood Lahore, from1st May 2020 to 30th June 2020. A total of 150 patients were included in the study. The diagnosis of COVID-19 was confirmed by reverse transcriptase polymerase-chain-reaction test (RT-PCR) of SARS-CoV-2 on nasopharyngeal swabs from these patients.

RESULTS:

The data was analyzed using SPSS 21. The frequency of ABO blood groups were collected using frequencies and percentages. All the patients admitted in Farooq Hospital, Westwood colony, Lahore were included in this study. The age range of the patients infected with Coronavirus was 30-90 years. The male to female ratio was 3:1. The percentage distribution of blood group types A, B, AB and O in 150 patients with COVID-19 was 27% (n=41), 40% (n=60), 12% (n=18) and 21% (n=31) respectively (Table-1).The patients with blood group O had a lower risk of COVID-19 than non-O blood group patients. (Table-1)

This study also showed that the distribution of patients is the same between all ages and different sex groups.

The percentage distribution of patients with prolonged hospital stay (≥ 7 days) in blood groups A,B,AB and O is 61%, 53%, 54%, 42% respectively. (Table-2)

Table-1: Frequency of ABO blood groups in different age groups of COVID-19 patients

Blood Groups				
Total patients	A % (n=41)	B % (n=60)	AB % (n=18)	O % (n=31)
150	27% (41)	40% (60)	12% (18)	21% (31)

Table-2: Frequency of COVID-19 +ve patients with different duration of hospital stay among ABO blood groups of patients

Duration of Hospital stay	A % (n=41)	B % (n=60)	AB % (n=18)	O % (n=31)
Less than 7 days	39% (16)	47% (28)	45% (8)	58% (18)
≥ 7 days	61% (25)	53% (32)	54% (10)	42% (13)

DISCUSSION:

SARS coronavirus is causing major concern all over the world these days. Many variations have been observed in clinical symptoms and the severity of COVID disease.[1] Cheng et al proved that there is a strong association between certain blood groups and the SARS coronavirus. It has been documented that populations with blood group O are at lower risk of developing COVID-19 infection.[8] Recently during the outbreak of COVID-19, analysts from China, Columbia University, and Iran observed the relationship of ABO blood groups to corona disease.[6,9,10]

Moreover, this study showed that the median age of the patients was 60 years which was in accordance with research done by Murthy et al, in 2020.[11] The results of the single-arm meta-analysis done by Li Lq et al[12] showed that there was a higher percentage of male gender among COVID-19 patients (60%) and this outcome is in conformity with our data showing 75% males of COVID-19 patients who presented in corona unit of Farooq Hospital Westwood.

In the present study, the percentage distribution of blood groups in COVID patients showed that the majority had blood group B (40%). Data from previous studies revealed that blood group B is dominant in Pakistan Population.[13] On the other hand, patients having blood group O are less

(21%) than non-O groups. A genome-wide association study in Europe discovered people with O blood group are at less risk of acquiring infection and developing severe COVID disease than people with non-O groups.[10] We also observed that 61% of patients with blood group A required prolonged hospital stay (≥ 7 days) as compared to patients with blood group O (42%). Wu Y et al also suggested that patients with blood group A were at higher risk than other blood groups (OR = 1.544).[14] Some other researchers also found a consistent negative association of blood group O to COVID-19 patients as compared to non-O groups.[5,6]

CONCLUSION:

In conclusion ABO blood groups have a strong association with COVID-19. More research work with a large number of COVID-19 patients in this field can provide significant information about the novel Corona risk virus infection among different blood groups.

AUTHOR'S CONTRIBUTION:

AA: Conceived and presented data
SA: Collection of data
OF: Editing and presentation of data
MU: Data analysis
AW: Writing of manuscript
AM: Analytical calculation

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