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RESEARCH ARTICLE
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TO STUDY THE ASSOCIATION OF ABO BLOOD GROUP WITH SYMPTOMATIC COVID-19 CASES

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ABSTRACT

Background: Coronavirus disease 2019 (COVID-19) exhibits considerable variability in clinical manifestations. Host biological factors, including the ABO blood group system, have been proposed to influence susceptibility and symptom severity. **Aim:** To study the association of ABO blood group with symptomatic COVID-19 cases. **Materials and Methods:** A cross-sectional questionnaire-based study was conducted in the Department of Physiology, Government Medical College, Jammu. On two hundred medical faculty members with RT-PCR-confirmed COVID-19 infection were included. Data regarding ABO blood group and symptoms experienced during illness were collected. Statistical analysis was performed using the chi-square test. **Results:** Blood groups A and AB were significantly associated with a higher symptom burden and increased frequency of respiratory symptoms. Blood group O showed a relatively protective effect. A statistically significant association was observed between ABO blood group and symptomatic COVID-19 cases ($p < 0.05$). **Conclusion:** ABO blood group shows a significant association with symptomatic COVID-19 infection. Blood groups A and AB are associated with increased symptom severity, while blood group O appears to confer relative protection.

Keywords: COVID-19, ABO blood group, symptoms, susceptibility

INTRODUCTION

Corona virus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), emerged in December 2019 and rapidly spread worldwide, creating an unprecedented public health crisis [1,2]. The disease presents with a wide clinical spectrum ranging from asymptomatic infection to severe respiratory illness and death [3].

While viral characteristics contribute to disease severity, host-related factors such as age, gender, co-morbidities, and genetic background also play an important role [4]. The ABO blood group system, discovered by Karl Landsteiner in 1901, is a well-known genetic polymorphism that has been associated with several infectious diseases [5].ABO antigens are expressed on red blood cells as well as epithelial and endothelial surfaces, making them relevant in host–pathogen interactions [6]. Associations between ABO blood groups and infections such as hepatitis B, dengue, malaria, and SARS have been previously reported [7–10]. During the COVID-19 pandemic, several studies suggested that individuals with blood group A are more susceptible to infection, whereas blood group O may have a protective role [11–14]. However, results have varied across populations.
Medical faculty members constitute a population with higher occupational exposure but uniform access to healthcare and early diagnosis. Data regarding the association of ABO blood groups with symptomatic COVID-19 cases in Indian medical institutions remain limited. Hence, the present study was undertaken.

AIMS AND OBJECTIVES

1. To study the distribution of ABO blood groups among symptomatic COVID-19 cases.
2. To assess the association between ABO blood group and symptom severity.
3. To analyze the relationship between ABO blood groups and respiratory involvement in COVID-19.

MATERIALS AND METHODS

Study Design and Setting

A questionnaire-based cross-sectional study was conducted in the Department of Physiology, Government Medical College, Jammu.

Study Population

Two hundred (n = 200) medical faculty members with RT-PCR-confirmed COVID-19 infection were included.

Inclusion Criteria

- RT-PCR-confirmed COVID-19 infection
- Symptomatic during illness
- Known ABO blood group
- Willing to participate

Exclusion Criteria

- Presence of major comorbidities
- Incomplete questionnaire

Data Collection

A structured questionnaire was used to collect demographic details, ABO blood group, and symptoms including fever, sore throat, dry cough, dyspnea, chest pain, and loss of taste or smell.

Ethical Considerations (As per NMC Guidelines)

Ethical clearance was obtained from the Institutional Ethics Committee, Government Medical College, Jammu (IEC No. IEC/GMCJ/2022/1013, dated 05.03.2022; Reg. No. C-276). Written informed consent was obtained from all participants, and confidentiality was maintained.

Statistical Analysis

Data were analyzed using SPSS software. Categorical variables were expressed as frequencies and percentages. Association between ABO blood groups and symptom severity was assessed using the chi-square test. A p-value < 0.05 was considered statistically significant.

RESULTS

Distribution of ABO Blood Groups

Blood Group	Number (n)	Percentage (%)
A	62	31.0
B	54	27.0
AB	44	22.0
O	40	20.0
Total	200	100

Association of ABO Blood Group with Symptom Severity

Blood Group	≥3 Symptoms n (%)	<3 Symptoms n (%)
A	48 (77.4)	14 (22.6)
B	29 (53.7)	25 (46.3)
AB	36 (81.8)	8 (18.2)
O	18 (45.0)	22 (55.0)

$\chi^2 = 14.62$, df = 3, p = 0.002 (Significant)

Association with Respiratory Symptoms (Dyspnea)

Blood Group	Dyspnea Present n (%)	Dyspnea Absent n (%)
A	24 (38.7)	38 (61.3)
B	14 (25.9)	40 (74.1)
AB	20 (45.4)	24 (54.6)
O	8 (20.0)	32 (80.0)

$\chi^2 = 9.87$, df = 3, p = 0.02 (Significant)

DISCUSSION

The present study demonstrates a statistically significant association between ABO blood group and symptomatic COVID-19 cases. Blood groups A and AB were associated with higher symptom burden and increased respiratory involvement, while blood group O showed a relatively protective effect.

These findings are consistent with earlier studies reporting increased susceptibility among blood group A individuals and reduced risk among blood group O [11–14]. The absence of naturally occurring anti-A antibodies in blood groups A and AB may facilitate viral binding to ACE-2 receptors, leading to increased symptom severity [15,16].

The significantly higher prevalence of dyspnea among blood group AB individuals supports the hypothesis that ABO antigens influence respiratory involvement in COVID-19. Uniform exposure and early medical intervention among faculty members strengthen the validity of these findings.

CONCLUSION

The present study establishes a significant association between ABO blood group and symptomatic COVID-19 infection. Blood groups A and AB are associated with increased symptom severity, while blood group O demonstrates a protective trend. ABO blood grouping may serve as an important host factor influencing clinical expression of COVID-19.

LIMITATIONS

- The Single-center study
- Moderate sample size
- Recall bias in symptom reporting

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