

# The influence of ABO blood type on the severity of COVID-19

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## The influence of ABO blood type on the severity of COVID-19

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### Letter to Editor

In the study of I. Solmaz and S. Ataç published in your journal “ABO blood groups in COVID-19 patients; Cross-sectional study”, it was determined that patients with blood group A are more susceptible to the disease than those with blood group O, and the infection has no effect on the prognosis of patients in intensive care unit (ICU). In our report, in addition, the effect of the ABO blood type on patients hospitalized in ICU on patients hospitalized in infectious diseases clinic (IDC) was also compared.

It has been demonstrated that there is a relationship between the risk of SARS-CoV infection and blood types, and that the blood group O has a protective effect against SARS-CoV-1 and SARS-CoV-2.<sup>1,2</sup> In these studies, the authors observed that the percentage of individuals with blood group O was significantly lower amongst patients requiring hospitalization for severe COVID-19 infection, whereas blood group A was significantly more common in patients compared to local population. As a result, blood group O has a significant protective effect.<sup>2</sup> Blood group antigens can modify the innate immune response to infection.<sup>3</sup> Natural human anti-A antibodies might block the interaction between SARS-CoV and its receptor, thereby providing protection, which could explain why individuals with blood group A were more susceptible to SARS-CoV-2 infection, while individuals with blood group O were not.

It was found that the anti-A antibodies found in individuals with blood group O inhibited the interaction of SARS-CoV-1 virus S spike protein and the ACE-2 receptor.<sup>3</sup> Multiple studies have shown that ABO blood group is an important risk factor for cardiovascular diseases and venous thromboembolism. The risk of thrombosis is significantly reduced in blood group O compared to non-O individuals. COVID-19 is associated with coagulopathy, and microthrombi disseminated through the long vasculature contribute to SARS-CoV-2.<sup>4</sup> The association between ABO blood group and COVID-19 susceptibility is of particular importance. ABO effects on vonWillebrand factor (VWF)/FVIII and platelet biology play a major role in determining the reduced risk of thrombosis observed in blood group O subjects. Regarding the association of ABO blood group with COVID-19 sensitivity, it is important to note markedly elevated plasma VWF-Ag and FVIII levels in patients with severe SARS-CoV-2 pneumonia.<sup>5</sup>

In this report, the blood group of each patient was obtained from the ABO blood type database. The medical records of 304 ICU and 1325 IDC patients with COVID-19 were divided into 4 groups, A,B,O, and AB, according to different ABO blood types. The ABO blood group distribution of ICU patients was analyzed and compared with ABO blood group distribution of IDC group. In addition, the results of patients

who died and survived in ICU were compared with chi-square and Fisher's exact tests. The blood group A is the most common for both groups of patients, followed by O, B, and AB blood types. Even though the percentages of all blood types were not significantly different, blood group A showed a higher frequency and blood group O a lower frequency for ICU patients ( $P = 0.07$  and  $0.09$ , respectively) (Table 1). COVID-19 patients hospitalized in IDC passed the disease moderately and symptoms were less severe compared to ICU patients. This comparison revealed that the ABO blood group has no effect on the severity of SARS-CoV-2 pneumonia. Subsequently, the frequency of ICU patients who died or survived according to ABO blood group was compared. Table1 represents that there are no differences between the blood groups in respect of death or life.

**Keywords:** COVID-19, SARS-CoV-2, coronavirus disease, ABO blood type

**Conflicts of interest** *There are no conflicts of interest in this report.*

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