

Is Your Blood Type More Prone to COVID-19 Infection?

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✓ Fact Checked

STORY AT-A-GLANCE

- › Some research suggests your blood type may make you more prone to certain diseases, including COVID-19
- › A study found a protein on the surface of SARS-CoV-2 – called the receptor binding domain (RBD) – had a strong preference for binding to blood group A found on respiratory cells
- › The findings may provide some insight into why people with blood type A appear to have a greater risk of COVID-19 and infection with other coronaviruses such as SARS-CoV
- › Other studies have also suggested that people with blood type A may have greater susceptibility to COVID-19 while those with type O may have lower susceptibility
- › Since blood type isn't something you can change, it's wise to focus on the strategies you can influence to lower your risk of disease, such as optimizing your vitamin D levels, eating right and optimizing your weight

Since the start of the COVID-19 pandemic, it's been clear that not everyone is equally susceptible to the virus that causes it – SARS-CoV-2. Many factors influence your likelihood of getting sick if you're exposed to a virus, including underlying health conditions and your overall lifestyle.

Blood type, however, is another factor that may be involved, as some research suggests your blood type may make you more prone to certain diseases, including COVID-19.¹

Since blood type isn't something you can change, it's wise to focus primarily on those strategies you can influence to lower your risk, such as optimizing your vitamin D levels, eating right and [optimizing your weight](#). That said, a study published in Blood Advances found a protein on the surface of SARS-CoV-2 – called the receptor binding domain (RBD) – had a strong preference for binding to blood group A found on respiratory cells.²

Blood Type Basics

Blood is categorized based on the type of antigen it contains. Antigens are proteins on red blood cells, and all humans have one of four blood types – A, B, AB or O. A third antigen, called Rh factor, will either be present or absent. If your blood has it, then you're Rh positive. If it doesn't, you're Rh negative.³

“When antigens come into contact with substances that are unfamiliar to your body, such as certain bacteria, they trigger a response from your immune system. The same type of response can occur during a blood transfusion if your donor's blood type doesn't match with yours. In that case, your blood cells could clump and cause potentially fatal complications,” Dr. Douglas Guggenheim explained to Penn Medicine.⁴

This is why, prior to 1901, without knowledge of these different antigens, [blood transfusions](#) were very dangerous. When different blood types were mixed during transfusion, it resulted in clumping of the blood and toxic reactions. On the surface of the red blood cell are one, two or no antigens. The four blood types are broken down as follows:⁵

- Group A – only antigen A on the red cells (and B antibody in the plasma)
- Group B – only antigen B on the red cells (and A antibody in the plasma)
- Group AB – both antigens A and B on the red cells (but neither A nor B antibody in the plasma)
- Group O – neither antigens A nor B on the red cells (but both A and B antibody are in the plasma)

Both the A/AB/B/O and Rh antigens are genetically passed from both parents to their children.

Are People With Type A Blood More at Risk of COVID-19?

Type O blood is the most common blood type while about 33% of Caucasians, 24% of African Americans, 27% of Asians and 29% of Latino Americans have type A+ blood. A- blood type is much rarer, found in only 7% of Caucasians and 2% or less of African Americans, Asians and Latino Americans.⁶

In the featured study, researchers tested how SARS-CoV-2 RBD interacted with respiratory and red blood cells in different blood types. They noted, "The RBD of SARS-CoV-2 shares sequence similarity with an ancient lectin family known to bind blood group antigens."⁷ Their testing revealed that SARS-CoV-2 RBD preferentially recognized and attached to the blood type A antigen found in the lungs.

According to the study, "SARS-CoV-2 RBD binds the blood group A expressed on respiratory epithelial cells, directly linking blood group A and SARS-CoV-2."⁸ While the study doesn't definitively demonstrate that blood type A directly contributes to SARS-CoV-2 infection, the findings may provide some insight into why people with blood type A appear to have a greater risk of COVID-19 and infection with other coronaviruses such as SARS-CoV.⁹

Study author Dr. Sean Stowell of Brigham and Women's Hospital, Harvard Medical School explained in a news release:¹⁰

"It is interesting that the viral RBD only really prefers the type of blood group A antigens that are on respiratory cells, which are presumably how the virus is entering most patients and infecting them.

Blood type is a challenge because it is inherited and not something we can change. But if we can better understand how the virus interacts with blood groups in people, we may be able to find new medicines or methods of prevention."

Blood Type as Significant Predictor of COVID-19 Risk

Genome-wide association studies identified that the locus responsible for **blood type** may be a significant genetic predictor of SARS-CoV-2 infection risk.¹¹ In fact, in an October 2020 issue of the New England Journal of Medicine, researchers reported, “We identified a 3p21.31 gene cluster as a genetic susceptibility locus in patients with COVID-19 with respiratory failure and confirmed a potential involvement of the ABO blood-group system.”¹²

In a study of COVID-19 cases in Wuhan, China, women with blood type A were again found to have greater susceptibility to COVID-19.¹³ Similar results were confirmed using data from 14,112 individuals tested for SARS-CoV-2 with known blood type in the New York Presbyterian (NYP) hospital system.¹⁴

Non-O blood types were found to have a slightly increased risk of infection, while types AB and B had an increased risk of intubation, and type AB had an increased risk of death, compared to type O.

“We estimated Rh-negative blood type to have a protective effect for all three outcomes,” those researchers noted, adding, “Our results add to the growing body of evidence suggesting blood type may play a role in COVID-19.” A systematic review and meta-analysis, which analyzed 31,300 samples, also found a link, with blood type A having an increased risk of infection from COVID-19 and blood type O appearing to be less susceptible.¹⁵

A Danish study of more than 500,000 people also found that blood type O was associated with a decreased risk for contracting SARS-CoV-2 infection.¹⁶ The home-based genetic testing company 23andMe also released preliminary results from a study they conducted using the information of more than 750,000 people.¹⁷ Their early results suggest that a person's blood type has an influence on their susceptibility to the virus.

The company reported that the percentage who tested positive for COVID-19 by blood type was 4.1% for blood group AB.¹⁸ The differences reported in the study showed that

those with type O had a 9% or 18% lower potential for testing positive for the virus when compared to those with blood types A, B or AB.¹⁹

In a separate study, researchers found that individuals with blood type O Rh positive had the best protection.²⁰ Still, more research is needed to determine if blood type is a significant factor in COVID-19, as at least one study found no association between blood type and COVID-19 risk. Those researchers noted:²¹

“Given the large and prospective nature of our study and its strongly null results, we believe that important associations of SARS-CoV-2 and COVID-19 with ABO groups are unlikely and will not be useful factors associated with disease susceptibility or severity on either an individual or population level for similar environments and ancestries.”

Blood Type Is Associated With Other Diseases

While blood type’s role in COVID-19 infection remains to be determined, blood type is known to play a role in other diseases, such as **hepatitis B** and dengue hemorrhagic fever.²² Even chronic diseases like diabetes, heart disease and cognitive decline may be affected.

For instance, people with blood type B+ have a 35% increased risk of **Type 2 diabetes** compared to those with type O-.²³ Those with blood types A and AB were also at increased risk compared to type O — AB+ had a 26% increased risk, A- a 22% increased risk and A+ a 17% increased risk.

As for why, it’s been suggested that blood type may influence endothelial or inflammation markers, as well as plasma soluble intercellular adhesion molecule 1 (ICAM-1) and TNF receptor 2 (TNF-R2) levels, which have been associated with increased Type 2 diabetes risk.

It’s also possible that blood type is a genetically determined factor that influences the makeup of your intestinal microbiota, which in turn affects your metabolic health via energy balance, glucose metabolism and low-grade inflammation.²⁴

As for cognitive impairment, those with blood type AB may be at increased risk,²⁵ possibly due to its effects on alternative pathways such as the VIII-von Willebrand factor (vWF) complex. Two large cohort studies with more than 20 years of follow-up also found a link between blood type and risk of coronary heart disease (CHD). According to the study, published in *Arteriosclerosis, Thrombosis and Vascular Biology*:²⁶

“In the combined analysis adjusted for cardiovascular risk factors, compared with participants with blood group O, those with blood groups A, B, or AB were more likely to develop CHD. Overall, 6.27% of the CHD cases were attributable to inheriting a non-O blood group.”

Proactive Steps You Can Take to Avoid Getting Sick

Whether or not blood type turns out to be a major player in COVID-19 infection risk, it's not something you can control. There are, however, many other factors that you can control. If you're obese, for instance, focusing on healthy weight loss may help to ward off viral illnesses, including COVID-19.

Nutrition-wise, I recommend adopting a [cyclical ketogenic diet](#), which involves radically limiting carbs (replacing them with healthy fats and moderate amounts of protein) until you're close to or at your ideal weight, ultimately allowing your body to burn fat – not carbohydrates – as its primary fuel.

This includes avoiding all ultraprocessed foods and also limiting added sugars to a maximum of 25 grams per day (15 grams a day if you're insulin-resistant or diabetic). [KetoFasting](#), the program I developed and detail in my book, "[KetoFast: A Step-By-Step Guide to Timing Your Ketogenic Meals](#)," combines a cyclical ketogenic diet and intermittent fasting with cyclical partial fasting to optimize weight, health and longevity.

In addition, get regular exercise each week and increase physical movement throughout your waking hours, with the goal of sitting down less than three hours a day, while also getting sufficient sleep, [optimizing your vitamin D levels](#) and tending to your emotional health.

Chronic stress may increase your risk for visceral fat gain over time,²⁷ which means **addressing your stress levels** is imperative for maintaining your ideal weight and lowering your risk of infection. Taking steps to lead a healthy lifestyle overall will have a snowball effect, bolstering your resilience against many types of infection and disease.

Sources and Reference

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