Jhovana Escamilla

Dr. Finke

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Virus Neutralizing Antibody Therapy for COVID-19

Jhovana Escamilla and Marc Nahmani

Under the circumstances we are living in today, it is beneficial to understand the importance of virus-neutralizing antibodies and their relationship to SARS-Co-V-2 therapies. COVID-19 statistical data from the CDC show that as of May 2022, there have been 83,706,662 confirmed cases of COVID-19, and 1,003,743 deaths due to the COVID-19 virus in the United States. There has also been a significant decrease in vaccinations, which was an average of about 32,000 daily at the start of the year and now averaging at about 10,000. Furthermore, there continue to be breakthrough cases of COVID-19 despite individuals getting vaccinated. In this review, the relationships between virus-neutralizing antibodies and COVID-19 therapies, such as vaccines, were explored to determine if these two therapies would result in improved prevention and decreased transmission of COVID-19. Studies show that RNA viruses, such as COVID-19, have fast mutation rates. The COVID-19 vaccine regulates the spike (S) protein found on the virus from interacting with the ACE2 receptor in our bodies. Antibody therapies are used to identify and neutralize pathogenic bacteria and viruses. Unlike vaccines, antibody therapy does not involve an inactivated virus, instead it is a protein that works with the immune system to destroy antigens. The idea of combining two antibody treatments concurrently in an individual has been hypothesized to improve the prevention of COVID-19 infection, decrease transition rates of COVID-19, and also decrease the mutation rate of the virus. Literature on combining antibody therapies has shown that combining specific antibodies (e.g., AX290 and AX677) that target the spike (S) protein in COVID-19 have shown that there is higher neutralizing activity than an antibody would on its own. These data suggest that combining antibody therapies holds the potential to decrease susceptibility to the COVID-19 virus and help fight against fast mutations of the virus that would further affect our society.