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Antibody Response against Severe Acute Respiratory Syndrome Coronavirus 2 Messenger Ribonucleic Acid Vaccines in Infected Individuals: A Systematic Review

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Abstract

Individuals with a history of coronavirus disease 2019 (COVID-19) exhibit memory immunity acquired during natural infection. However, a decline in immunity after infection renders these individuals vulnerable to re-infection, in addition to a higher risk of infection with new variants. This systematic review examined related studies to elucidate the antibody response in these infected individuals after

messenger ribonucleic acid (mRNA) vaccination. Hence, the focus of this review was to ascertain differences in the concentration of binding and neutralising antibodies of previously infected individuals in comparison to those of infection-naïve individuals after administration of two doses of mRNA vaccination through available case-control and cohort studies. Positive reverse transcriptase-polymerase chain reaction (RT-PCR) test or detectable anti-severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) antibodies at the baseline in included studies showed categorisation of infected and uninfected individuals. This review utilised three online databases: PubMed, Scopus and Cochrane with the following keywords: (COVID-19 OR 'Coronavirus Disease 2019' OR SARS-CoV-2) AND Immun* AND (Pfizer OR BioNTech OR BNT162b2 OR Comirnaty OR Moderna OR mRNA-1273) from January 2019 to July 2021. Following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocol (PRISMA-P) 2020 guidelines and assessment based on the Crowe Critical Appraisal Tool (CCAT), we included 13 related qualified papers of observational studies discerning the binding and neutralising antibody concentrations of infected and uninfected individuals after administration of mRNA vaccines, such as the BNT162b2 and mRNA-1273 vaccine. The mRNA vaccines induced robust binding and neutralising antibody responses in both groups. However, infected individuals showed induction of higher antibody responses in a shorter time compared to uninfected individuals. Hence, a single dose of mRNA vaccination for infected individuals may be sufficient to reach the same level of antibody concentration as that observed in uninfected individuals after receiving two doses of vaccination.

Author keywords

antibodies; antibody response; COVID-19; mRNA vaccine; SARS-CoV-2; vaccine

Indexed keywords

Drug tradenames

SciVal Topics

Chemicals and CAS Registry Numbers

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