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OPINION

Immunization during COVID-19

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INTRODUCTION

The prevalence and intensity of infection with different viruses, including coronaviruses like MERS, can both rise as a result of antibody-dependent enhancement (ADE). Although some in vitro COVID-19 studies have indicated that previous vaccination can increase SARS-CoV-2 infection, preclinical and clinical studies have shown the opposite to be true. We looked at a group of COVID-19 patients as well as a group of people who had received either a recombinant (Moderna/Pfizer) or a similar (Pfizer/Pfizer) immunization regimen. Utilizing an in vitro model with CD16- or CD89-expressing cells and the Delta (B.1.617.2 lineage) and Omicron (B.1.1.529 lineage) variants of SARS-CoV-2, the dependence on IgG or IgA of ADE of infection was assessed on the serum samples from these subjects (26 vaccinated individuals and twenty-one PCR-positive SARS-CoV-2-infected patients). None of the studied viral variations was detected in the sera from COVID-19 individuals. After the second dosage of the vaccine, some serum samples from vaccinated people showed a weak IgA-ADE effect with Omicron, but this effect was eliminated once the entire immunization protocol had been followed. This research did not find any evidence of the FcRIIIa- and FcRI-dependent ADE of SARS-CoV-2 infection following previous vaccination, which may have increased the risk of serious illness in a subsequent natural infection. The COVID-19 pandemic's culprit, the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which has a profoundly negative impact on public health, is linked to a markedly higher death rate in cancer patients, particularly those with hematological malignancies.

DESCRIPTION

Less than a year after the pandemic outbreak, the documented mortality rate among those who underwent hematopoietic stem cell transplantation (HSCT) with COVID-19 varied between 22% and 32% for allogeneic HSCT and 28%-33% for autologous HSCT. This would increase the already high 3 year transplant-related death rate of 20% for patients of allogeneic transplants and 5% for those receiving autologous transplants. Major international efforts to combat the COVID-19 pandemic have prompted the immediate creation of mRNA vaccines, which have proven to be highly effective in Phase 3 clinical studies. These vaccines include BNT162b2 (Pfizer/BioNTech) and mRNA-1273 (Moderna). Additionally, none of these individuals had ever gotten an HSCT. Notably, data from the influenza immunisation shows that such patients are known to have an attenuated immune response to vaccines, particularly in the first few months following transplantation. The evaluation of the immunogenicity, safety, and effectiveness of anti-COVID-19 vaccines in this patient group is crucial in light of the aforementioned considerations. Previous research on the SARS-CoV-2 vaccine's serological reaction following allogeneic HSCT found a broad variety of response rates, ranging from 37% to 96%, between 7 and 28 days after the second dosage. However, there is presently little known about the dynamics of anti-SARS-CoV-2 antibody titers and how this patient group responded to the third dosage of the vaccine.

CONCLUSION

The humoral reaction and clinical efficacy of the BNT162b2 vaccine in the general population have significantly decreased, according to recent research, six months after vaccination. Patients who have weakened immune systems may experience even more extreme adverse outcomes. The present study aimed to assess the clinical efficacy and long-term immunological response to the BNT162b2 mRNA vaccine in allogeneic HSCT recipients and to identify predictors of response as well as the potential effects of a booster dose on immunity in this susceptible patient group. ADE has been a significant source of worry in various viral illnesses like Dengue, Zika, and respiratory syncytial virus. We demonstrate that SARS-CoV2 infection is not exacerbated by immunization or preceding natural infection, contrary to previous speculation that ADE may play a role in SARS-CoV2 infection in vitro. These findings are in contrast to earlier research wherein FcR-mediated enhancement of SARS-CoV-2 infection in vitro was observed in patients with severe illness or convalescent serum. For instance, serum antibodies may be a factor in the cytokine storm associated with COVID-19 disease, as demonstrated by Shimizu et al.'s finding that patients with serious disease patients' serum elevated viral infection as well as IL-6 release in a myeloid cell line.

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