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ABSTRACT

Title: Efficacy and impact of SARS-CoV-2 vaccination on cancer treatment for breast cancer patients: A multi-center prospective observational study

Purpose

Vaccination is an essential strategy to prevent infection and serious condition in the SARS-CoV-2 pandemic. However, there are concerns about vaccine efficacy and the impact of vaccination on cancer treatment. Additionally, the emergence of novel variants may affect vaccination efficacy. This multi-center, prospective, observational study investigated the efficacy and impact of vaccination against SARS-CoV-2 variants on treatment among breast cancer patients in Japan.

Methods

Patients with breast cancer scheduled to be vaccinated with the SARS-CoV-2 vaccine from May to November 2021 were prospectively enrolled (UMIN000045527). They were stratified into five groups according to their cancer treatment: no treatment, hormone therapy, anti-human epidermal growth factor receptor (HER) 2 therapy, chemotherapy, and cyclin dependent kinase 4/6 (CDK4/6) inhibitor. Serum samples for assessing serological responses were collected before the first vaccination and after the second vaccination.

Results

Eighty-five breast cancer patients were included. The overall seroconversion rate after second vaccination was 95.3% and the lowest seroconversion rate was 81.8% in the patients under chemotherapy. The overall positivity rate of neutralizing antibodies against the wild-type, alpha, delta, kappa, and omicron variants were 90.2%, 81.7%, 96.3%, 84.1%, and 8.5%, respectively. Among the patients under chemotherapy and CDK4/6 inhibitors, various degrees of decreased neutralizing antibody titers against SARS-CoV-2 variants were observed. Withdrawal or reduction of systemic therapy because of vaccination was observed in only one patient.

Conclusion

Our data support SARS-CoV-2 vaccination for breast cancer patients. However, a reduction in neutralizing antibody titers was suggested during chemotherapy and CDK4/6 inhibitors, raising concerns about the impact on long-term infection prevention.