Cystic Fibrosis Research News

Title:
Immunogenicity of the COVID-19 BNT162b2 vaccine in adolescents and young adults with cystic fibrosis

Lay Title:
Immune response after COVID-19 vaccination in cystic fibrosis patients

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What was your research question?
The research question was to investigate if young cystic fibrosis (CF) patients elicit adequate antibody responses after the first and second dose of Pfizer-BioNTech COVID-19 vaccine. In addition to study if immune responses differ depending on sex, age or regarding cystic fibrosis-related medical history.

Why is this important?
Published data regarding immunogenicity and safety of Pfizer-BioNTech vaccine in CF patients comparing with healthy population are limited. In addition, it is not known what the epidemiological or clinical conditions within the CF population are, that may affect the immunogenicity of COVID-19 vaccines. Results regarded the elicited immune responses could differentiate guidelines regarding the need for booster doses in CF population.

What did you do?
A total of 33 CF patients (no transplant recipient) and 66 healthy controls who were vaccinated with Pfizer-BioNTech vaccine were recruited in the study. Each participant completed a form containing demographic, clinical data and adverse events after each dose

of the vaccine. We prospectively measured total and neutralizing antibodies of SARS-CoV-2 spike protein in three time-points: before the vaccination, one day before the second vaccine dose and one month after the second dose and investigated possible associations with epidemiological and clinical parameters as well as local and systemic adverse events.

What did you find?

CF group (median age: 19.6 years) had higher levels of total and neutralizing antibodies after both COVID-19 vaccine doses, compared to healthy controls (median age: 31 years). Within the CF group, antibodies did not significantly differ regarding gender, local or systemic adverse events, pancreatic status, genotype of disease, medications or chronic *P. aeruginosa* infection. Local adverse events were limited and reported less frequently in the CF than in the control group after both doses. Systemic adverse events were less commonly reported in the CF group after the second dose, but did not differ significantly after the first dose.

What does this mean and reasons for caution?

Pfizer-BioNTech vaccine induced adequate or even higher immune responses in CF patients compared to the controls regardless of disease genotype, underlying comorbidities, or medication. Limited acute adverse events were reported in CF population. Limitation of the study was the lack of age and gender matching between the two study groups. Higher antibody responses can be attributed to the younger age of CF participants compared to the controls, since older age negatively affects vaccine immune responses. However, it is uncertain whether CF itself predisposes to stronger immune responses after COVID-19 immunization. More long-term studies are required to elucidate the pathophysiologic basis for these findings.

What's next?

CF patients need longitudinal follow up regarding the kinetics of antibodies after immunization and the effectiveness of COVID-19 vaccines in preventing respiratory disease and complications. Further investigation of cellular immune responses in CF and surveillance of rare adverse events are important in order mass vaccination policies to be optimized.

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