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Background: mRNA vaccines trigger a higher humoral response to SARS-CoV-2 in adults after a previous infection. This study aimed to profile the early and long-term humoral response to the BNT162b2 vaccine in children with or without a previous COVID-19.

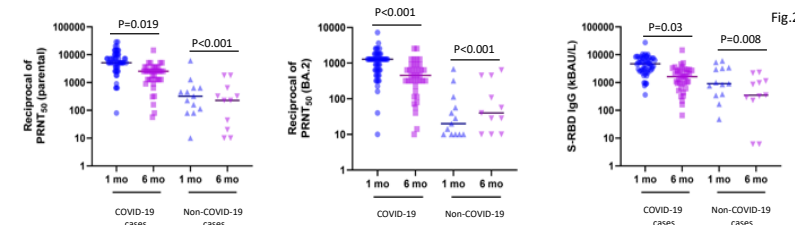
Aims: To profile the humoral response to the BNT162b2 vaccine in children with or without a previous COVID-19.

Results:

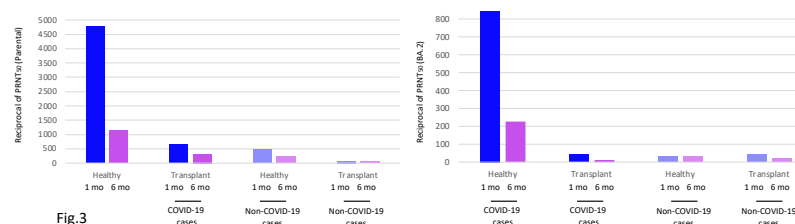
60 children were included:

- 26 (43.4%) were females; median age of 8 years (IQR=7-10.7)
- 47 (78.3%) COVID-19 cases (36 [76.6%] were healthy children [HC], 2 [4.3%] immunocompromised [IC], 1 [2.1%] solid organ transplant [transplant], and 8 [17%] had a previous MIS-C)
- 13 (21.7%) were non-COVID-19 cases (4 [30.8%] HC, 6 [46.2%] IC, and 3 [23.1%] transplant).

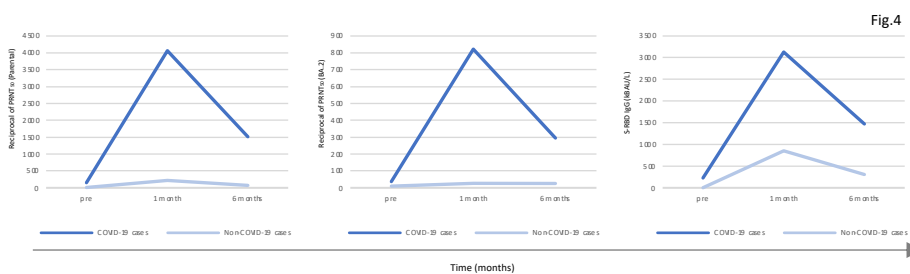
mRNA vaccines induce a higher humoral response in children after a previous infection compared to naïve-vaccinated individuals at both 1 and 6 months after vaccination (Fig.2).



SOT recipients recovered lower NAbS and anti-S-RBD IgG titers compared to HC at both 1 and 6 months after vaccination, regardless a previous COVID-19 (Fig.3).



All children showed a decline in both anti-S-RBD IgG and NAbS titers between 1 and 6 months after vaccination, regardless a previous COVID-19. Despite this, both anti-S-RBD IgG and NAbS titers at 6 months were higher compared to pre-vaccination levels (Fig.4).



Conclusions:

- mRNA vaccines triggered a higher humoral response in children with previous COVID-19 compared to naïve-vaccinated peers
- Inferior Abs titers were observed in SOT recipients
- This findings provide insight into boosting preexisting immunity and the need for additional preventive strategies to protect immunocompromised children from infection and severe disease.

Methods:

- Evaluation of the immune response to BNT162b2 vaccine in children aged 5-11 years attending the Pediatric Departments at University of Padua and Bambino Gesù Children's Hospital in Rome (Italy) between Dec-2021 to Feb-2023
- Neutralizing antibodies (NAbS) and anti-S-RBD IgG titers were analyzed through Plaque Reduction Neutralization Test (PRNT) and chemiluminescent immune-enzymatic assay (CLIA), respectively, at pre-, 1, and 6 months after vaccination (Fig.1).

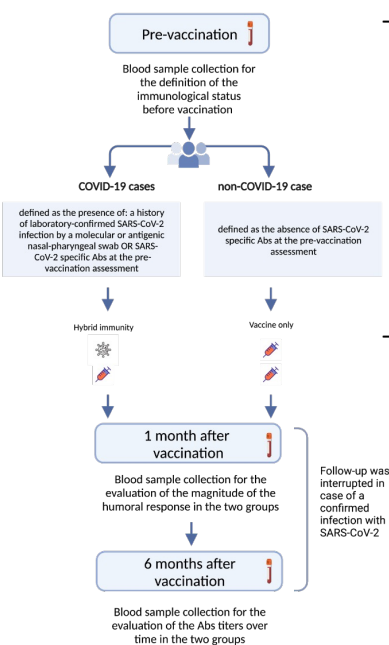


Fig.1

Additional key information:

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