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.

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).

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).

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.

No competing financial interests declared.

Additional key information:
Contact: costanza.delmarra@phd.unipd.it
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