

Fading SARS-CoV-2 humoral and sustained cellular immunity in convalescent children and adolescents

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April 18, 2023

Abstract

Cross-reactive cellular and humoral immunity can substantially contribute to antiviral defense against SARS-CoV-2 variants of concern (VOC). While the adult SARS-CoV-2 cellular and humoral immunity and its cross-recognition potential against VOC is broadly analyzed, similar data regarding the pediatric population are missing. In this study, we perform an analysis of the humoral and cellular SARS-CoV-2 response immune of 32 convalescent COVID-19 children (children), 27 convalescent vaccinated adults(C+V+) and 7 unvaccinated convalescent adults (C+V-). SARS-CoV-2 reactive T cell response is analyzed via multiparametric flowcytometry and humoral immunity is addressed via pseudovirus neutralization assay. Similarly to adults, a significant loss of neutralizing capacity against delta and omicron VOC was observed 6 months after SARS-CoV-2 infection. While SAR-CoV-2 neutralizing capacity was comparable among children and C+V- against all VOC, children demonstrated as expected an inferior humoral response when compared to C+V+. Nevertheless, children generated SARS-CoV-2 reactive T cells with broad cross-recognition potential. When compared to V+C+, children presented even comparable frequencies of WT-reactive CD4+ and CD8+ T cells with high avidity. Our results suggest that following SARS-CoV-2 infection children generate a humoral SARS-CoV-2 response with neutralizing potential comparable to unvaccinated COVID-19 convalescent adults as well a sustained SARS-CoV-2 cellular response cross-reactive to VOC.

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