

COVID-19 is milder in children possibly due to cross-immunity

Dear Editor,

It has been unclear why the new severe acute respiratory syndrome coronavirus (sars-CoV-2) hits a small minority hard, while the vast majority of children appear to be protected and develop mild or no disease.^{1,2} The editorial by Brodin suggests some possible mechanisms why it is so.¹ I would like to emphasise the significance of cross-immunity due to previous exposure to seasonal coronavirus; it may be a plausible explanation for why children appear to be protected.^{2,3}

Seasonal coronaviruses that cause innocent colds in children lead to the formation of antibodies that last for 1-3 years. One of the four seasonal coronaviruses, human coronavirus NL63 (HCoV-NL63), also uses angiotensin converting enzyme 2 (ACE2) as a receptor. In a recent study published in March 2020, it was found that convalescent serum from patients who survived SARS could neutralise binding of the sars-CoV-2 to ACE2, thus blocking the uptake of sars-CoV-2 into the cells.³ This suggests that there is distinct possibility of cross-immunity, wherein immunity and antibody responses to one virus can have a significant effect on another.^{3,4}

Patients who survived SARS virus in 2003 produced neutralising antibodies to the S protein with long-lasting immunity for 8-10 years.⁵ A study in 2005 showed that SARS patients developed rising titres of antibody that cross-reacted against seasonal coronaviruses. Antibodies to HCoV-NL63 increased approximately 10 times. T cells are also crucial for coronavirus immunity to kill virus-infected cells. It is quite possible that long-lived memory T cells that first responded to childhood coronavirus in childhood and which can now cross-react to similar sars-CoV-2 peptide antigens.⁴

To summarise, there is a clear possibility of cross-immunity against sars-CoV-2 for T and B cells that have previously protected us from seasonal coronavirus. Children probably seem to be protected from Covid-19 because they have a well-functioning or rapidly responding immune system that also does not tend to overreact

to the present coronavirus family. Furthermore, the immune system in children and adolescents probably has ample experience with the viral family through exposure to regular seasonal coronavirus.

CONFLICTS OF INTEREST

None.

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