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RNA is not virus

To the Editor:

Yonker et al demonstrated high levels of viral RNA in nasopharyngeal samples obtained from children.[1] A plausible explanation for the seemingly counterintuitive lack of symptoms and high viral load is the methods employed are detecting high viral RNA, which does not correlate to high viral load as the authors suggest. Establishing a correlation between RNA and virus in the asymptomatic pediatric population with a virus culture is a prequisite for assertion that RNA positive children carry high viral loads.[2] An alternative explanation is that the children in the study, and generally most children, mount an effective immune response to subclinical infection. That immune response causes lysis of infected cells, spilling cellular contents including viral RNA and proteins into surrounding tissue or interference with viral assembly inhibiting excretion of infectious virus. High RNA in nasopharyngeal samples obtained from asymptomatic patients is a reflection of an effective immune response rather than high viral load, explaining minimal infectivity of such subjects.[3]

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The author declares no conflicts of interest.

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Reply

To the Editor:

In our article, we report high viral load in children infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in the first 2 days of illness. We did not assess the viability of virus from these respiratory secretions and agree that RNA does not necessarily correlate with live virus. However, in hospitalized adults, live virus is readily cultured from respiratory secretions during the first week of symptoms.[1] It is plausible that differences exists between pediatric and adult immune responses to SARS-CoV-2[2]; distinctions in mucosal immune responses could impact viral detection by reverse-transcription polymerase chain reaction and/or severity of symptoms. Another plausible hypothesis is that SARS-CoV-2 could colonize the upper airways efficiently in both children and adults but children may be less likely to have colonization in the lower respiratory tract. Although we described SARS-CoV-2 serology and show that infected children mount a humoral response following infection, we did not assess mucosal responses or regional differences of viral load within the airways. Research is needed to test these hypotheses.

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