

# Enhancing Predictive Accuracy of Pediatric COVID-19 Mortality: Integrating Clinical Indicators Beyond HCT-ALB [Letter]

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## Dear editor

We are very interested in the study by Zhu et al titled “Hematocrit and Albumin Levels at Admission Predict In-Hospital Mortality in Pediatric COVID-19 Omicron Variant Patients”. This research established a simple and accessible predictive model for in-hospital mortality in children infected with the COVID-19 Omicron variant, which may significantly impact clinical practice. However, as mentioned in the paper, the rapid spread of the Omicron variant may be attributed to the increased binding affinity of the spike protein to the human Angiotensin-Converting Enzyme 2 (ACE2) receptor.<sup>1</sup> Therefore, we believe that incorporating clinical indicators related to the pathogenesis of the COVID-19 Omicron variant may provide greater specificity and sensitivity than the HCT-ALB alone.

ACE2 serves not only as a critical entry point for viral invasion but also as a key regulator of the renin-angiotensin-aldosterone system (RAAS).<sup>2</sup> Early during viral infection of ACE2, viral load often reflects the severity of the infection.<sup>3</sup> As the virus binds to ACE2, its functionality diminishes, resulting in decreased serum levels of ACE2 and elevated levels of angiotensin II, which can lead to vasoconstriction and inflammation.<sup>4</sup> Indicators such as blood pressure, heart rate, capillary refill time, urine output, and blood gas analysis can effectively reflect changes in the patient's condition. Furthermore, while D-dimer was included in the univariate regression analysis with a significant odds ratio, it was not part of the multivariate regression analysis. Given its critical role in reflecting the activity of intravascular thrombosis and fibrin degradation, we recommend its inclusion. Other indicators of coagulopathy, such as coagulation time and platelet count, may also be valuable. The imbalance of ACE2 can lead to multi-organ damage, particularly in the lungs, heart, and kidneys.<sup>5</sup> Therefore, we suggest utilizing the oxygenation index ( $\text{PaO}_2/\text{FiO}_2$ ), indicators of respiratory failure, CT imaging, cardiac biomarkers, and renal function parameters.

In summary, we concur with the predictive role of HCT-ALB for in-hospital mortality in children with the Omicron variant and hope the authors will consider our suggestions in future clinical work.

## Disclosure

The authors report no conflicts of interest in this communication.

## References

1. Zhu Y, Li L, Wang W, et al. Hematocrit and albumin levels at admission predict in-hospital mortality in pediatric COVID-19 Omicron Variant patients. *Infect Drug Resist.* 2024;17:4067–4078. doi:10.2147/IDR.S479580
2. Jawad B, Adhikari P, Podgornik R, Ching WY. Binding interactions between receptor-binding domain of spike protein and human angiotensin Converting Enzyme-2 in Omicron Variant. *J Phys Chem Lett.* 2022;13(17):3915–3921. doi:10.1021/acs.jpclett.2c00423
3. Zou L, Ruan F, Huang M, et al. SARS-CoV-2 Viral Load in upper respiratory specimens of infected patients. *N Engl J Med.* 2020;382(12):1177–1179. doi:10.1056/NEJMc2001737

4. Tsampasian V, Corballis N, Vassiliou VS. Renin-angiotensin-aldosterone inhibitors and COVID-19 Infection. *Curr Hypertens Rep.* 2022;24(10):425–433. doi:10.1007/s11906-022-01207-3
5. Beyerstedt S, Casaro EB, Rangel ÉB. COVID-19: angiotensin-converting enzyme 2 (ACE2) expression and tissue susceptibility to SARS-CoV-2 infection. *Eur J Clin Microbiol Infect Dis.* 2021;40(5):905–919.

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