

# Smell/Taste alteration in COVID-19 may reflect zinc deficiency

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Coronavirus-2019 (COVID-19), the disease caused by Severe Acute Respiratory Syndrome 2019 (SARS-CoV-19) results in heterogenous symptoms, with outcomes ranging from asymptomatic to death.<sup>(1)</sup> Markers predicting disease severity, and suggesting methods of treatment, are critically needed. Symptoms of anosmia/ageusia reported in COVID-19 may reflect an adaptive response of locally decreased nasopharyngeal zinc (Zn), ultimately resulting in decreased ACE-2,<sup>(2)</sup> a crucial receptor for Sars-CoV-19 binding. Such locally decreased Zn response was suggested to result in subsequently decreased COVID-19 severity.<sup>(2)</sup>

Missing from discussion of COVID-19-induced anosmia/ageusia is reference to older literature demonstrating associations between viral infection and altered taste/smell, and between these variables and Zn deficiency. In a sample of 35 individuals reporting taste/smell dysfunction, 51% reported it occurred immediately prior to/concurrent with, respiratory illness. Zn mitigated symptoms, though administration protocol was not described.<sup>(3)</sup> In a group of 103 people with altered taste/smell, 57% reported abrupt onset “during or soon after a respiratory illness”, with three-days or more of fever also demonstrating association. Zn levels were decreased in those with taste/smell disruption, and Zn (zinc sulfate) supplementation mitigated the symptoms in a single-blind study.<sup>(4)</sup>

If mechanisms involved in smell/taste alteration in/following other illnesses is similar to that which occurs during COVID-19,

restoration of taste/smell in COVID-19 affected individuals might be possible via Zn. It is notable that duration of altered taste/smell in these earlier participants ranged from 7 months to 49 years,<sup>(4)</sup> with a mean of 3.5 years. Given ‘long-COVID’ has been reported<sup>(5)</sup> taste/smell alterations in this disease may persist. A method to restore normal taste/smell would enhance quality of life in these individuals if this occurs. Interestingly, in this older literature, a range of altered taste and smell was reported. If Zn deficiency is associated with the previously reported anosmia/ageusia in COVID-19, then other alterations of taste/smell may be occurring in COVID-19 as well. Lastly, further study of the smell/taste alterations in COVID-19 would be useful to determine whether it is due to Zn deficiency locally or systemically, to alteration in gustatory or olfactory chemoreceptors, some combination of these possibilities, or due to some other cause.

Altered taste/smell following, or concurrent with, viral illness is not unusual, and may share mechanisms with that which occurs during COVID-19. If so, such information may be useful for treatment of ‘long-COVID’, as well as for helping to elucidate—and potentially mitigate—mechanism involved in disease severity.

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Ruth E. Propper, Ph.D.\*

Psychology Department, Montclair State University,  
1 Normal Avenue, Montclair, NJ 07043, USA

\*E-mail: propper@montclair.edu

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