



Electronic cigarette and vaping should be discouraged during the new coronavirus SARS-CoV-2 pandemic

Emilie Javelle¹

Received: 1 April 2020 / Accepted: 7 April 2020
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

Keywords Coronavirus · SARS-CoV-2 · COVID-19 · Vaping · e-cigarettes · Lung injuries

Since their introduction to the market in 2003, electronic substance delivery systems and vaping products have been increasingly used with the assumption that they are less toxic than tobacco smoking. The number of vapers has risen to 41 million worldwide in 2018 and could reach almost 55 million by 2021. These systems typically contain nicotine, but also flavorings and other chemicals, or even marijuana. They work by heating the e-liquid or e-oil provided in cartridges to produce an aerosol with vapor that is inhaled into the lungs.

As early as 2012, electronic cigarette-induced acute lung injury was reported. In August 2019, the Centers for Disease Control and Prevention declared an “outbreak” of the e-cigarette or vaping product use-associated lung injury (EVALI). In this case series, computed tomography (CT scan) of the chest revealed diffuse basilar-predominant infiltrates with opacities and nodular lesions. Bronchoalveolar lavage cytology found extensive lipid within alveolar macrophages without evidence for alveolar hemorrhage or eosinophilia. Acute lipoid pneumonia was supposed to be caused by aerosolized oils from e-cigarettes deposited in alveoli, inducing local inflammation that impaired gas exchange.

Since then, other imaging patterns suggesting different mechanisms of injury, not all of them being acute, have been reported attributable to vaping, including acute eosinophilic pneumonia, diffuse alveolar damage, and organizing pneumonia (Henry et al. 2019). In clinical trials, vaping induced airway epithelial injury and sustained decrement in transcutaneous oxygen tension in young tobacco smokers, and transiently impaired arterial oxygen tension in heavy smokers (Chaumont et al. 2019).

The emergent SARS-CoV-2 virus, transmitted most readily by droplets and aerosolization, is highly contagious and manifests with severe or critical bilateral pneumonia in 20% of symptomatic infected cases. The severe coronavirus disease-2019 (COVID-19) resulting from SARS-CoV-2 infection is characterized by respiratory distress and decreased oxygen saturation. However, even in asymptomatic patients, imaging features representing diffuse peripheral bilateral ground-glass opacities have been highlighted, and asymptomatic carrier state is suspected to be contagious (Shi et al. 2020).

Considering their potential acute pulmonary toxicity, vaping products should be considered at risk of enhancing respiratory disease caused by SARS-CoV-2. Moreover, aerosols and vapor generated by electronic substance delivery systems could participate in the dissemination of the virus in the close proximity of SARS-CoV-2 infected vapers.

We suggest monitoring e-cigarette impact on COVID-19 severity. In vaper cases, chest CT scan could be performed weeks after COVID-19 to control the regression of lung injuries. Lastly, it should be recommended to suspend the use of e-cigarettes during the period of SARS-Cov-2 circulation or at least from the onset of symptoms.

References

- Chaumont M, van de Borne P, Bernard A, Van Muylem A, Deprez G, Ullmo J, Starczewska E, Briki R, de Hemptinne Q, Zaher W, Debbas N (2019) Fourth generation e-cigarette vaping induces transient lung inflammation and gas exchange disturbances: results from two randomized clinical trials. *Am J Physiol Lung Cell Mol Physiol* 316(5):L705–L719. <https://doi.org/10.1152/ajplung.00492.2018>
- Henry TS, Kanne JP, Kligerman SJ (2019) Imaging of vaping-associated lung disease. *N Engl J Med* 381:1486–1487. <https://doi.org/10.1056/NEJMc1911995>

✉ Emilie Javelle
emilie.javelle@gmail.com

¹ Laveran Military Hospital, Aix Marseille University, IRD, AP-HM, SSA, VITROME, Marseille, France

Shi H, Han X, Jiang N et al (2020) Radiological findings from 81 patients with COVID-19 pneumonia in Wuhan, China: a descriptive study. *Lancet Infect Dis*. [https://doi.org/10.1016/S1473-3099\(20\)30086-4](https://doi.org/10.1016/S1473-3099(20)30086-4)

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.