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The EVALI outbreak and vaping in the COVID-19 era



In August, 2019, the first case of EVALI (e-cigarette, or vaping, product use-associated lung injury) was reported to the US Centers for Disease Control and Prevention (CDC). The number of cases peaked in Sept, 2019, and as of Feb 18, 2020, 2807 EVALI cases had been reported with 68 deaths. Owing to the declining incidence of EVALI cases and the emergence of the COVID-19 pandemic, the CDC updates were stopped in February. However, more recently, concerns have been raised about the convergence of vaping, and its effects, with COVID-19 infection—especially in young people.

One of the main causes of the EVALI outbreak is thought to be vitamin E acetate, which has been added to vaping products as a diluent. It has been found in the bronchoalveolar lavage fluid of cases, but not in healthy control participants. Tetrahydrocannabinol-containing products, and the purchase or obtaining of products from informal sources, such as family and friends, have also been noted for many of the cases. Unfortunately, although understandable in the current circumstances, as new EVALI updates are not being issued by the CDC, and cases are declining, the exact causes of the outbreak, which are probably multifactorial, are likely to remain uncertain, although research is ongoing.

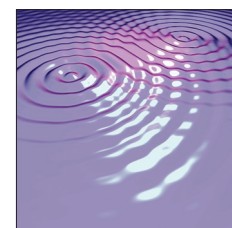
A study by Sarah Reagan-Steiner and colleagues published on Aug 4, 2020, describes pathological findings from autopsy and lung biopsy samples from patients with EVALI, submitted to the CDC, and provides valuable information to aid further understanding of the outbreak. The paper emphasises that EVALI remains a diagnosis of exclusion, highlighting the importance of thorough history taking, especially given that symptoms and clinical manifestations overlap with those of some infectious respiratory diseases, including COVID-19. The authors also note that autopsy case series—which have proved to be valuable during the COVID-19 pandemic—can enlighten in terms of alternative diagnoses, improving surveillance efforts, and can provide insights into the clinical disease course and underlying pathology, which could point to new treatment directions.

Of note, a recent population-based study published on Aug 11, 2020, which surveyed 4351 adolescents and young adults aged 13–24 years, has highlighted how the effects of vaping might now be colliding

with the risk of COVID-19. Those reporting use of e-cigarettes only, or dual use with tobacco, were at a five-times or seven-times increased risk, respectively, of a COVID-19 diagnosis, compared with non-users. These findings were adjusted for several major confounders, such as age, sex, and obesity. Dual users within the past 30 days were also at an increased risk of having COVID-like symptoms. Given the known damage to the lungs in EVALI cases, highlighted in the autopsy series described above, the finding of an increased risk of a COVID-19 diagnosis in those who vape is pertinent. Preliminary evidence has also suggested that nicotine might upregulate the ACE2 receptor, the point of SARS-CoV-2 viral entry, and work is underway to study the effects of vaping on this receptor. The accumulating evidence for risks of COVID-19 in those who use e-cigarettes has prompted legislators to write a letter to the US Food and Drug Administration (FDA) commissioner, Dr Stephen Hahn, earlier this week, asking for e-cigarettes to be withdrawn from the market during the pandemic.

Although those of a younger age are generally thought to be at a lower risk of developing COVID-19 disease than older age groups, all efforts should be made to prevent a young and susceptible population from vaping. Steps in the right direction have been made over the past year. These include raising the age at which e-cigarettes can be bought, the US Tobacco 21 legislation, the FDA's measures in Feb, 2020, to reduce the number of flavours available, and appropriate taxing of these products in the USA.

For many adults, the pandemic has been a time to stop smoking, and according to a study from Action and Smoking for Health and University College London, more than a million have quit in the UK during the pandemic. Public Health England recommends e-cigarettes as an option to aid quitting; however, surely the precautionary principle should be adopted to mitigate potential damage to the lungs and susceptibility to infection in the COVID-19 era. Smoking cessation services should focus on traditional aids to quitting while the level of evidence on long-term safety and a possible interaction between COVID-19 and e-cigarette use remains uncertain, and while our knowledge on the causes of EVALI continues to unfold. ■ *The Lancet Respiratory Medicine*



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For more on **vitamin E acetate** see *N Engl J Med* 2020; **382**: 697–705

For more on the **causes of EVALI** see *Chest* 2020; published online Aug 3. <https://doi.org/10.1016/j.chest.2020.07.068>

For more on the **autopsy and lung biopsy case series** see **Articles** *Lancet Respir Med* 2020; published online Aug 4. [https://doi.org/10.1016/S2213-2600\(20\)30321-0](https://doi.org/10.1016/S2213-2600(20)30321-0)

For the **podcast by Sarah Reagan-Steiner and colleagues** see <https://www.thelancet.com/journals/lanres/home>

For the **population-based survey** see *J Adolesc Health* 2020; published online Aug 11. <https://doi.org/10.1016/j.jadohealth.2020.07.002>

For the **letter to the FDA commissioner** see <http://cdn.cnn.com/cnn/2020/images/08/11/2020.08.11.rk.to.fda.re.vaping.and.coronavirus.pdf>

For more on **vaping in adolescents** see **Editorial** *Lancet Respir Med* 2020; **8**: 217

For more on **steps to reduce vaping in the young** see *N Engl J Med* 2020; **382**: e54