

# Electronic-Cigarette (Vapors) Smoking and the Risk of COVID-19

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## Dear Editor

In December 2019, four unexplained pneumonia cases were accounted to the World Health Organization from Wuhan, China.<sup>1</sup> Many risk factors are associated with the increase in the incidence and the severity of Covid-19, including diabetes, smoking, asthma, and cardiovascular disease. Soon after, Severe Acute Respiratory Syndrome Coronavirus 2 spread rapidly worldwide. In March 2020, the World Health Organization announced the outbreak as a pandemic.<sup>2</sup>

Electronic cigarettes, one of the most common electronic nicotine delivery systems, are devices that heat the liquid and create an aerosol that the user inhales.<sup>3</sup> This liquid contains nicotine (but not tobacco) and other chemicals that may harm human health. A meta-analysis study in China determined that smokers were at higher risk for coronavirus-19 infection than non-smokers.<sup>4</sup>

Given the COVID-19 pandemic and its morbidity and mortality worldwide, this article's obvious question is: Is e-cigarette use a critical risk factor for COVID-19 infection? Is the incidence of COVID-19 different between e-cigarette smokers and non-smokers? Can quitting e-cigarettes reduce the incidence of COVID-19 in this group? Can quitting e-cigarettes mitigate the severity of COVID-19 infection in its users?

The results of a study by Gaiha showed that e-cigarette smokers were 3.3 times (CI 95%: 1.77-5.94), e-cigarettes and cigarettes smokers were 3.6 times (CI 95%: 1.96-6.54), and cigarette smokers were 3.9 times (CI 95%: 1.48-10.86) more likely to come for a Covid-19 diagnostic test.<sup>5</sup> However, in a case-control study by Jose et al., Patients who used only e-cigarettes were less likely to have a COVID-19 diagnosis (OR 0.93 [0.69-1.25], P=0.628), whereas those who used only cigarettes had a decreased risk (OR 0.43 [0.35-0.53], P<0.001). The OR for dual users fell between these two values (OR 0.67 [0.49-0.92], P=0.013). Although e-cigarettes have a well-documented potential for harm, they do not appear to increase susceptibility to SARS-CoV-2 infection.<sup>6</sup>

In patients who used only e-cigarettes, the diagnosis of COVID-19 was not higher (OR 0.93 [0.69-1.25], P=0.628), whereas those who used only cigarettes had a lower risk (OR 0.43 [0.35-0.53], P<0.001).

The odds ratio for dual users was between these two values (OR 0.67 [0.49-0.92], P=0.013).

Although e-cigarettes are well documented to harm, they do not appear susceptible to SARS-CoV-2 infection.<sup>6</sup>

Gonzalez's study found that the lockdown during the Covid-19 epidemic in California was not associated with more cigarette and e-cigarette users. Users were even less likely to smoke e-cigarettes post-lockdown compared to pre-lockdown although it was shown that quarantine is associated with increased cigarette consumption among current smokers. Furthermore, there are concerns about increased smoking-related behaviors in areas with high levels of dissatisfaction.<sup>7</sup> Also, McAlinden et al. showed that exposure to cigarette gas condensate and e-cigarettes is toxic to bronchial epithelial cells. Cell membrane damage by the e-cigarette aerosol condensate and cigarette smoke extract

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is detectable after 24 hours of exposure. Significant morphological changes in BEAS-2B cells can be detected after 24 hours of exposure to e-cigarette aerosol condensate, and cigarette smoke extract.<sup>8</sup>

COVID-19 has affected a considerable number of people around the world. Evidence shows that e-cigarette users are affected by its negative impact on respiratory system function, lung vulnerability, and smoking-related behaviors. Among the related behavioral factors, frequent hand-to-mouth contact is one of the COVID-19 transmission approaches, which is common among smokers (both cigarettes and e-cigarettes).<sup>9</sup> Also sharing e-cigarettes, which is common among e-cigarette users, may exacerbate the COVID-19 transmission rate.<sup>10</sup>

Our paper proposes the following hypotheses:

1. Smoking e-cigarettes is a significant risk factor for COVID-19 infection with symptoms and its course.
2. The incidence of COVID-19 is higher in e-cigarette smokers than non-smokers.
3. By quitting e-cigarettes, the incidence of COVID-19 infection will be reduced.

However, due to the lack of information and data in this field, it is necessary to examine and test these hypotheses in analytical studies with full compliance with ethical principles.<sup>11, 12</sup>

**Keywords:** Coronavirus, COVID-19, Electronic-Cigarette

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