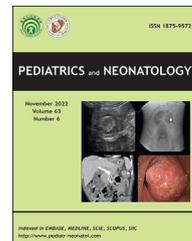


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## Images

# Electronic cigarette vaping product use is associated with lung injury in a 15-year-old adolescent

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A 15-year-2-month-old boy presented with progressive and persistent upper abdominal pain and productive cough for 3 days before admission. A physical examination revealed crackles in the right lung, a distended abdomen, and tenderness over the upper abdomen. A chest radiograph (Fig. S1a) and chest computed tomography scan revealed blunting of bilateral costophrenic angles and multiple infiltrative nodules in both lungs with sparing of the left upper lobe (Fig. S1b and c). Laboratory tests showed leukocytosis and an elevated C-reactive protein level.

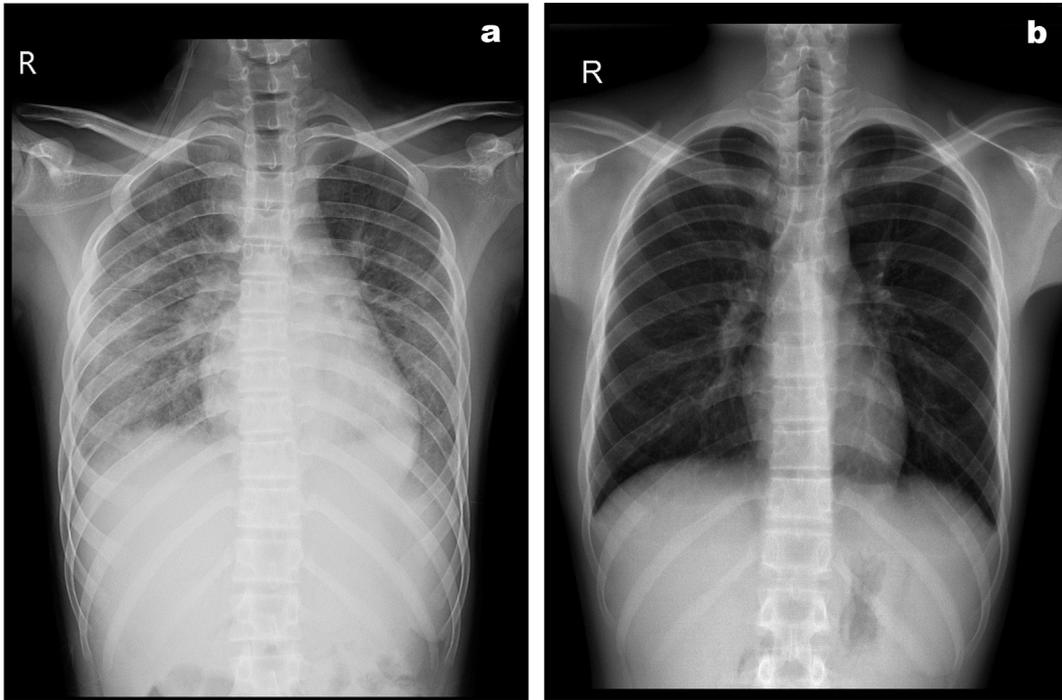
He complained of dyspnea on Day 3 with a SpO<sub>2</sub> of 88% on room air; thus, an O<sub>2</sub> cannula was administered at 3 L/min. The chest radiograph had progressed (Fig. 1a). We performed a bronchoscopy on Day 5, which revealed hyper-vascularity of the mucosa in the bronchus and bronchial trees. We did not detect any specific pathogen or malignant cells in the bronchoalveolar lavage fluid. The dyspnea improved, and we removed the O<sub>2</sub> cannula on Day 6. The history of using electronic cigarette (e-cigarettes) for 4

years and cigarettes for weeks was determined by a psychological consultant. Methylprednisolone was prescribed beginning on Day 8 under the impression of e-cigarette-associated lung injury (EVALI). A chest radiograph showed no infiltrative nodules (Fig. 1b).

E-cigarettes have been used since 2004<sup>1</sup> and the frequency of EVALI has increased with the increased use of e-cigarettes.<sup>2</sup> The chest radiographic findings of these patients range from normal to nodular opacity, patchy alveolar opacity, or mixed interstitial and alveolar opacities with central and lower lung predominance.<sup>2,3</sup> Our patient had increased infiltration with multiple infiltrative nodules. A previous study described the pulmonary computed tomography findings, including confluent ground-glass opacities, centrilobular ground-glass nodules, reticular interstitial opacities, air space opacities sparing the subpleural regions, bronchial wall thickening, and extrapulmonary findings, such as enlarged mediastinal or hilar lymph nodes, pleural effusion, and pericardial effusion.<sup>2</sup>

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**Figure 1** (a) Chest radiograph on Day 3 shows progressive infiltration in both lungs and increased pleural effusion compared to the previous radiograph. (b) Chest radiograph on Day 8 illustrates bilaterally clear lungs. No pleural effusion is evident.

Our patient revealed multiple infiltrative nodular opacities in both lungs, with relative sparing of the left upper lobe with pleural effusion.

#### **Declaration of competing interest**

The authors declare that they have no conflict of interest.

#### **Appendix A. Supplementary data**

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pedneo.2022.05.006>.

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