PASSIVE EXPOSURE TO E-CIGARETTE EMISSIONS  
IRRITATION SYMPTOMS, SEVERITY AND DURATION

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Background
The current study aimed to test the hypothesis that passive exposure to e-cigarette emissions provokes systemic symptoms and to determine their severity and timing.

Methods
40 healthy nonsmokers, 18-35 years old, BMI<30, with normal spirometry, were passively exposed to e-cigarette emissions during a 30-minute Control and Experimental session (standardized e-cigarette smoking and topography by a human smoker). Average PM2.5 concentrations were 0.03 mg/m3 and 4.17 mg/m3 during the Control and Experimental sessions, respectively. Participants completed an Irritation questionnaire, grading symptom severity at t0 (pre-exposure), t15 (midway), t30 (exposure endpoint) and t60 (30-minute post-exposure) in both sessions. Scores were generated for complaints (Eyes, Nasal, Throat and General) and then dichotomized into presence or absence of symptoms.

Statistical Analysis
Association between reported e-cigarette visible aerosol cloud and complaints was conducted using Fishers exact test. Differences between the four time points for the presence of symptoms at the three different sessions were assessed using generalized estimating equations. Statistical significance was set to p<0.05. (STATA statistical software version 11.0 was used for the analysis).

Results
Most commonly reported symptoms during exposure sessions were ocular (dryness, burning and itchiness) nasal (dryness) throat (dryness, soreness, cough, breathlessness), headache and fatigue.

During the Experimental session, ocular symptom complaints increased significantly at t15 and t30 minutes and had returned to baseline values by t60 minutes. Similar results were observed for nasal complaints.

Throat and General irritation complaints also increased significantly at t15 and t30 minutes during the exposure and remained significantly higher at t60 minutes.

Number of Ocular and Throat complaints at both t15 and t30 minutes were significantly associated with reported visible e-cigarette aerosol cloud during the exposure (p<0.05)

Conclusion
Short-term exposure of nonsmokers to e-cigarette emissions resulted in mild ocular, nasal and airway symptoms that persisted up to 30 minutes and were positively correlated with environmental indices. Further research is needed to investigate the long-term implications on health.

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