Supplementary Material 1.

- Material and Methods

Aerosol containment devices

The four aerosol containment devices were based on previous studies.[1-3] The aerosol box had two openings (10-cm diameter) for endoscope insertion on the side facing the endoscopist; the patient's feet and left side remained exposed (Fig. 1A). The vinyl box was used with or without continuous aerosol suction; it had one opening (5-cm diameter) for endoscope insertion on the side facing the endoscopist (Figs. 1B and 1C). The modified mask had a 11-mm slit, and was worn by the mannequin during the endoscopy procedure (Fig. 1D).

Experimental setting and simulated endoscopy procedure

The simulation was performed in a self-contained endoscopy room with nine room air changes per hour. Six endoscopists performed upper GI endoscopy on a mannequin with a mouth guard, using a 9.9-mm flexible video GI scope (GIF-H290; Olympus Japan Limited, Tokyo, Japan). To simulate a strong cough, saline was sprayed via a 0.4-MPa pressure atomizer nozzle, which was placed in the hypopharynx of the mannequin.[3–5] A simulated cough was generated every 30 s for the duration of the 5-min trial. The aerosol containment device was then removed at the 300-s time point, and airborne particle counts were recorded for 1 min after device removal. A separate trial was conducted by each of the six endoscopists for the following experimental conditions, in random order: modified mask, aerosol box, vinyl box with continuous aerosol suction, vinyl box without continuous aerosol suction, and no aerosol containment device (control). Airborne particle counts were also recorded at baseline (prior to cough simulation) for each trial.

Assessment of endoscopist exposure to airborne particles

Airborne particles were measured using a portable HHPC6+ handheld particle counter (Beckman Coulter, Inc., Brea, CA, USA). This device measured particle counts per cubic foot for each airborne particle size (0.3, 0.5, 1, and 2 μm). Samples were collected over a period of 5 seconds with continuous monitoring, and there were no intervals between measurements. The particle counter was positioned on an intravenous pole set immediately in front of the endoscopist.

Statistical analysis

Differences in particle counts between groups were calculated using the Kruskal–Wallis one-way analysis of variance (ANOVA). Post-hoc analysis was performed with the Scheffe test. A two-sided p value of < 0.05 was considered to be statistically significant. All statistical analyses were performed using SPSS v22 (IBM Corp, Armonk, NY, USA).

REFERENCES

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