Alterations in Smell or Taste in Mildly Symptomatic Outpatients With SARS-CoV-2 Infection

Since December 2019, a pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread globally. A spectrum of disease severity has been reported, with main symptoms that include fever, fatigue, dry cough, myalgia, and dyspnea. Previous strains of coronavirus have been demonstrated to invade the central nervous system through the olfactory neuroepithelium and propagate from within the olfactory bulb. Furthermore, nasal epithelial cells display the highest expression of the SARS-CoV-2 receptor, angiotensin-converting enzyme 2, in the respiratory tree.

Despite anecdotal reports of anosmia, only 1 study to our knowledge has evaluated the prevalence of smell and taste disturbance in hospitalized patients with COVID-19, reporting an overall prevalence of 34% but without data on timing of onset in relation to other symptoms.

This study evaluated prevalence, intensity, and timing of an altered sense of smell or taste in patients with SARS-CoV-2 infections.

Methods  The study was approved by the ethics committee of Treviso and Belluno provinces, and informed consent was obtained verbally for telephone interviews. Adults (aged ≥18 years) consecutively assessed at Treviso Regional Hospital between March 19 and March 22, 2020, were included if they tested positive for SARS-CoV-2 RNA by polymerase chain reaction on nasopharyngeal and throat swabs that were performed according to the World Health Organization recommendation and if they were suitable for home management as mildly symptomatic.

Patients were contacted 5 to 6 days after the swab was performed, the demographic information was reported, and the Acute Respiratory Tract Infection Questionnaire (ARTIQ); with symptoms scored as none, 0; a little, 1; a lot, 2) was administered. During the telephone interview, they were asked whether they had experienced a sudden onset of an altered sense of smell or taste in the 2 weeks before the swab through completion of the Sino-nasal Outcome Test 22 (SNOT-22). The SNOT-22 grades symptom severity as none (0), very mild (1), mild or slight (2), moderate (3), severe (4), or as bad as it can be (5). Symptom prevalence was expressed as the percentage of total patients; 95% confidence intervals were calculated using the Clopper-Pearson method. Prevalence was compared using the Fisher exact test. A 2-sided P < .05 was considered statistically significant. Statistical analyses were performed using R version 3.6.
An altered sense of smell or taste was reported as the only symptom by 6 patients (3.0%). An altered sense of smell or taste was more frequent among 105 women (72.4%; 95% CI, 62.8%-80.7%) than among 97 men (55.7%; 95% CI, 45.2%-65.8%; P = .02).

Discussion | Alterations in smell or taste were frequently reported by mildly symptomatic patients with SARS-CoV-2 infection and often were the first apparent symptom. The results must be interpreted with caution due to study limitations: data were self-reported and based on a cross-sectional survey, the sample was relatively small and geographically limited, more severe patients were not included, and data regarding the subsequent course of the disease was not available. Although the SNOT-22 questionnaire has been shown to correlate with objective testing of olfactory function, patients may have difficulty in quantifying olfactory function; objective tests should be included in future studies.

If these results are confirmed, consideration should be given to testing and self-isolation of patients with new onset of altered taste or smell during the COVID-19 pandemic.

Giacomo Spinato, MD
Cristoforo Fabbri, MD
Jerry Polesel, MD
Diego Cazzador, MD
Daniele Borsetto, MD
Claire Hopkins, MA(Oxon), DM
Paolo Boscolo-Rizzo, MD

Author Affiliations: Section of Otorhinolaryngology, University of Padova, Treviso, Italy (Spinato, Fabbri, Boscolo-Rizzo); Unit of Cancer Epidemiology, Aviano National Cancer Institute, IRCCS, Aviano, Italy (Polesel); Section of Otorhinolaryngology, University of Padova, Padova, Italy (Cazzador); Guy’s and St Thomas’ Hospitals, London, United Kingdom (Borsetto, Hopkins).

Corresponding Author: Daniele Borsetto, MD, Guy’s Hospital, London SE1 9RT, United Kingdom (daniele.borsetto@gmail.com).

Accepted for Publication: April 14, 2020.

Published Online: April 22, 2020. doi: 10.1001/jama.2020.6771

Author Contributions: Drs Spinato and Boscolo-Rizzo had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Concept and design: Spinato, Borsetto, Hopkins, Boscolo-Rizzo.
Acquisition, analysis, or interpretation of data: Fabbri, Polesel, Cazzador, Borsetto, Hopkins, Boscolo-Rizzo.
Drafting of the manuscript: Spinato, Fabbri, Borsetto, Boscolo-Rizzo.
Critical revision of the manuscript for important intellectual content: Spinato, Polesel, Cazzador, Borsetto, Hopkins, Boscolo-Rizzo.
Statistical analysis: Polesel.
Administrative, technical, or material support: Fabbri, Borsetto.
Supervision: Spinato, Cazzador, Borsetto, Hopkins, Boscolo-Rizzo.
Exposure to a Surrogate Measure of Contamination From Simulated Patients by Emergency Department Personnel Wearing Personal Protective Equipment

A major challenge with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is the effective protection of health care workers. Recommendations for the use of personal protective equipment to protect against SARS-CoV-2 exposure by health care workers were recently published by the World Health Organization and the US Centers for Disease Control and Prevention. For aerosol-generating procedures, N95 respirators, eye protection, isolation gowns, and gloves were recommended. Coveralls, boots with a cover, gloves were recommended. Coveralls, boots with a cover, protective clothing.2,3

We assessed the protection of emergency physicians and nurses wearing the recommended personal protective equipment while caring for a simulated patient with respiratory distress.

Methods | A simulation study was conducted in the emergency department of Rambam Health Care Campus in Haifa, Israel, on March 21, 2020, examining the presence of a surrogate measure of contamination on exposed skin of participants wearing personal protective equipment to protect against SARS-CoV-2 exposure.4 Two scenarios of patients with respiratory distress requiring airway management similar to those commonly encountered in the emergency department were conducted using adult and child high-fidelity manikins (SimMan and SimJunior, Laerdal). An atomizing device (MAD Nasal, Teleflex) was used to simulate droplets exhaled during coughing episodes.5

The adult scenario consisted of a 74-year-old man experiencing fever and shortness of breath with a decline in oxygen saturation level prompting endotracheal intubation and peripheral intravenous cannulation. The simulation lasted 20 minutes. The simulated patient had 2 coughing episodes during which droplets were expelled from the manikin’s nostrils.5 Participating health care workers were instructed to provide airway management and ventilatory support meeting the standard of care for patients with the novel coronavirus disease 2019.6

The intubation was performed by the most skilled physician present using a rapid-sequence intubation technique and was assisted by a second physician. Because bag-mask ventilation prior to intubation could generate aerosols, participants were allowed to use it only when preoxygenation was ineffective. One nurse was responsible for intravenous access and medication administration and a second nurse recorded and assisted with all procedures.

The pediatric scenario was similar. Before the simulation, a nonvisible fluorescent compound (Glo Germ) as a marker of contamination was applied on predetermined surface areas (around the nose and mouth, palms, and upper chest) of the manikin and was added to the simulated secretion areas. After completion of the simulation and before donning, the fluorescent markers on the participants were visualized and photographed under UV light. The simulations were videotaped to capture all physical contacts between each participant and the manikin to assess possible infection risk.

The ethics committee of Rambam Health Care Campus waived the need for approval and consent because the study was considered a quality control project.

Results | For each simulation (adult and child manikins), 2 physicians and 2 nurses participated (8 total participants). All participants were experienced in emergency department care and had participated in resuscitations.

In the adult scenario, intubation was successful during the second videolaryngoscopic attempt. In the pediatric scenario, intubation was successful using direct laryngoscopy after 1 failed videolaryngoscopic attempt. Seven of 8 participants had fluorescent markers on their exposed skin, 6 on the neck and 1 on an ear (Figure).

All team members had fluorescent markers on their hair and 4 had markers on their shoes. During the adult and pediatric scenarios, there were 102 and 88, respectively, participant-manikin contacts.

Discussion | Despite personal protective equipment, fluorescent markers were found on the uncovered skin, hair, and shoes of participants after simulations of emergency department management of patients experiencing respiratory distress. The findings suggest that the current recommendations for personal protective equipment may not fully prevent exposures in emergency department settings. Clothing that covers all skin may further diminish exposure risk.