

### Self-reported Olfactory and Taste Disorders in Patients With Severe Acute Respiratory Coronavirus 2 Infection: A Cross-sectional Study

TO THE EDITOR—We read with interest the article by Wang et al [1] describing the clinical features of 69 patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in Wuhan, China. The authors provide a detailed description of major signs and symptoms of overt disease [2, 3], but fail to give an account of minor symptoms that may be present at earlier stages of the infection.

After some patients admitted for coronavirus disease 2019 (COVID-19) at the Infectious Disease Department of L. Sacco Hospital in Milan, Italy, complained of olfactory and taste disorders (OTDs), we performed a cross-sectional survey of the prevalence of these alterations in the context of SARS-CoV-2 infection. On 19 March 2020, a simple questionnaire including questions about the presence or absence of OTDs, their type and time of onset relative to hospitalization were submitted through verbal interview to all SARS-CoV-2-positive hospitalized patients who were able to give informed consent. Of 88 hospitalized patients, 59 were able to be interviewed (29 were nonrespondents, of whom 4 had dementia, 2 had a linguistic barrier, and 23 were on noninvasive ventilation) (Table 1). Of these, 20 (33.9%) reported at least 1 taste or olfactory disorder and 11 (18.6%) both. Twelve patients (20.3%) presented the symptoms before the hospital admission, whereas 8 (13.5%) experienced the symptoms during the hospital stay. Taste alterations were more frequently (91%) before hospitalization, whereas after hospitalization taste and olfactory alteration appeared with equal frequency. Females reported OTDs more frequently than males

**Table 1. Characteristics of Patients With Severe Acute Respiratory Syndrome Coronavirus 2 Infection Assessed for Taste and Olfactory Disorders (N = 59)**

Patients	No. (%)
Age, y, median (IQR)	60 (50–74)
Male sex	40 (67.8)
Days from illness onset to hospital admission, median (IQR)	6 (4–10)
Days from illness onset to the interview, median (IQR)	15 (10–21)
Pneumonia at hospital admission	43 (72.8)
Symptoms at hospital admission	
Fever	43 (72.8)
Cough	22 (37.3)
Dyspnea	15 (25.4)
Sore throat	1 (1.7)
Arthralgia	3 (5.1)
Coryza	1 (1.7)
Headache	2 (3.4)
Asthenia	1 (1.7)
Abdominal symptoms	5 (8.5)
No taste or olfactory disorders	39 (66.1)
With olfactory and/or taste disorders	20 (33.9)
Taste disorders only	
Dysgeusia	5 (8.5)
Ageusia	1 (1.7)
Olfactory disorders only	
Hyposmia	3 (5.1)
Anosmia	0 (0)
Mixed taste and olfactory disorders	
Dysgeusia and hyposmia	2 (3.4)
Dysgeusia and anosmia	2 (3.4)
Ageusia and hyposmia	2 (3.4)
Ageusia and anosmia	5 (8.5)

Data are presented as no. (%) unless otherwise indicated. Abbreviations: IQR, interquartile range; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

(10/19 [52.6%] vs 10/40 [25%];  $P = .036$ ). Moreover, patients with at least 1 OTD were younger than those without (median, 56 years [interquartile range {IQR}, 47–60] vs 66 [IQR, 52–77];  $P = .035$ ). All patients reported the persistence of OTDs at the time of the interview.

Olfactory and taste disorders are well known to be related with a wide range of viral infections [4, 5]. SARS-CoV has demonstrated in a mice model a transneural penetration through the olfactory bulb [6]. Moreover, angiotensin-converting enzyme 2 receptor, which is

used by SARS-CoV-2 to bind and penetrate into the cell, is widely expressed on the epithelial cells of the mucosa of the oral cavity [7]. These findings could explain the underlying pathogenetic mechanism of taste and olfactory disorders in SARS-CoV-2 infection.

Due to limitations related to the diffusivity of the disease and emergency contingencies, it was impossible to perform a more structured questionnaire associated with validated tests (ie, Pennsylvania smell identification test) [8]. However, our survey shows that OTDs are fairly frequent in patients with SARS-CoV-2 infection and may precede the onset of full-blown clinical disease. In a pandemic context, further investigations on nonhospitalized infected patients are required to ascertain if these symptoms, albeit unspecific, may represent a clinical screening tool to orientate testing of pauci-symptomatic individuals.

#### Notes

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