

Presentation with Anosmia and Ageusia: Possible Hidden Carriers of COVID-19

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Postviral olfactory loss is the second leading cause of loss of sense of smell (anosmia), accounting for up to 40% of adult cases,¹ mostly middle-aged or older women.² Influenza or common cold viruses, including coronavirus disease 2019 (COVID-19), account for 12% (10%–15%) of individuals with anosmia.³

Recently, anosmia/hyposmia (the reduced ability to smell and to detect odors) has been reported as a major presenting symptom in patients with COVID-19 in the absence of other typical symptoms. For this article, we compiled information available in the literature and social media, as well as the opinions of first-line healthcare providers who visited COVID-19 patients.

A significant increase in anosmia has been observed in patients with COVID-19, in particular younger (younger than 40 years) healthcare workers, presenting with isolated anosmia in northern Italy, Spain, France, Germany, the United Kingdom, the United States, Iran, and the Netherlands ($P < 0.001$).^{4,5} Because these individuals do not meet the criteria for COVID-19 testing or self-isolation, they as hidden carriers have induced widespread infection. Higher rates of COVID-19 infection have been reported in ear, nose, and throat (ENT) specialists who have performed upper airway procedures and examinations and in ophthalmologists in China, Italy, and Iran as compared with other healthcare workers.⁴

In a study of 2428 patients with COVID-19, 17% reported anosmia as their only symptom.⁶ Metra reported anosmia or dysgeusia (altered or impaired sense of taste) in the spouses of approximately 700 confirmed cases of COVID-19 infection in Italy.⁷ Mao et al detected hyposmia in 5.1% of hospitalized patients with COVID-19 in Wuhan, China.⁸ Approximately 1 in 3 (30% of 2000) cases with a positive COVID-19 test in South Korea⁴ and more than 2 in 3 confirmed COVID-19 cases in Germany presented only with anosmia.⁹

Hendrik Streeck, a German virologist who interviewed patients with coronavirus, explained that at least two-thirds of

>100 cases (66%) with mild infection had experienced anosmia and dysgeusia for several days.¹⁰ Wendtner, from Germany, noted that anosmia/hyposmia occurred regardless of the severity of the disease, even in the absence of congestion. The affected individuals regained their ability after a few days or weeks, and nasal drops or sprays were of no help.¹¹

In a multicenter European study, of a total of 417 patients with COVID-19, 85.6% had olfactory dysfunction, including anosmia (79.6%) and hyposmia (20.4%), reported to occur significantly more often in females ($P = 0.001$).¹² The olfactory dysfunction occurred before, after, or at the same time as other symptoms in 11.8%, 65.4%, and 22.8%, respectively; 18.2% of patients did not experience rhinorrhea or nasal congestion, and of this 18.2%, 79.7% were anosmic or hyposmic. A significant association was detected between anosmia and fever ($P = 0.014$). The most common treatments for olfactory dysfunction were nasal saline irrigations (16.7%) and nasal and oral corticosteroids (8.1% and 2.5%, respectively). The early olfactory recovery rate was 44.0%.¹²

Of 114 confirmed COVID-19 cases in France, 54 (47%) reported anosmia, with patients being a mean age of 47 (± 16) years and there was a predominance of females (67%); the same characteristics were found in the Lechien et al study population.¹² The mean duration of anosmia was 8.9 (± 6.3) days; however, durations of ≥ 7 and ≥ 14 days were reported in 55% and 20% of cases, respectively. Fifty-seven percent of patients had rhinorrhea and 30% had nasal obstruction. Diarrhea was frequently reported in patients with anosmia, which is in accordance with the study by Lechien et al.¹² Anosmia was associated with dysgeusia in 85% of patients.¹³

There are few reports of ENT symptoms, especially in Asian patients, which may be explained by a possible severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2) genomic mutation, the difficulty of reporting ENT symptoms in critical patients, or the specificity of SARS-CoV-2 receptor (angiotensin-converting enzyme 2) in an ethnic group.¹³

In a study by Bagheri et al in Iran, a significant correlation was detected between COVID-19 and olfactory dysfunction (75%, Spearman correlation coefficient = 0.87, $P < 0.001$), with a higher incidence in women (71%) and family members (48.23%).¹⁴

Previously, acute anosmia/hyposmia was reported following different viral infections. In a study by Konstantinidis et al, influenza and parainfluenza viruses were presented as major causes of postupper respiratory tract infection anosmia/hyposmia in March and May, respectively. Coronavirus was not considered to be a causative agent of anosmia in their study because it reaches its peak mainly in midwinter, and because there were few previously published articles on its incidence.¹⁵ The majority of patients in their study were older than age 50, which may be explained by reduced olfactory neuroepithelium regeneration in advanced age groups.^{16,17} The predominance of female sex in their study, especially in the postmenopausal age group, suggested that menopause puts olfaction at risk.¹⁴ Furthermore, the incidence of postviral anosmia/hyposmia followed a

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specific seasonal pattern, particularly in middle-aged and older adult patients.

The first report of anosmia in SARS was published in 2006. Hwang¹⁸ reported anosmia 3 weeks after the initial symptoms of SARS in a 27-year-old female nurse. Her anosmia persisted for >2 years in spite of her complete recovery from most SARS symptoms. It was concluded that olfactory neuropathy, including olfactory bulb or nerve damage, could be a rare type of neuropathy caused by coronavirus infection in SARS. As such, it was recommended that olfactory function tests be performed as a routine check for patients with SARS.¹⁸

The American Academy of Otolaryngology suggested adding dysgeusia, and especially anosmia, to COVID-19 screening criteria. Anosmia/hyposmia and dysgeusia in the absence of other respiratory diseases, including acute or chronic rhinosinusitis or allergic rhinitis, could be early symptoms of COVID-19 infection, highlighting the importance of self-isolation and testing.

To decrease the number of vectors and prevent the rapid spread of infection, Professor Claire Hopkins, president of the British Rhinological Society, and Professor Nirmal Kumar, president of ENT UK, suggested asking asymptomatic patients with anosmia to self-isolate for 7 days and urging healthcare personnel to use appropriate personal protective equipment when treating individuals with isolated anosmia. Professors Hopkins and Kumar also advised against performing unnecessary sinus endoscopy by ENT surgeons due to risk of being exposed to the virus, which replicates in the nose and throat.⁶

Considering the deterioration of COVID-19 infection by corticosteroid, Philpott advised not using oral steroids in patients with new-onset anosmia, especially when other etiologies such as head trauma or nasal abnormalities have been ruled out; however, nasal steroids are safe to apply.⁴

Gane et al¹⁹ suggested that isolated sudden onset anosmia (ISOA) be considered a syndrome of COVID-19. They also recommended that practitioners treat individuals with asymptomatic anosmia as possible positive COVID-19 cases and to avoid oral immunosuppressants.¹⁹

The information provided in the present article has its own limitations because it is based on the reports of healthcare workers and not on a case-control study. We believe, however, that during the 2020 COVID-19 pandemic, this information can be helpful to patients in the community and healthcare providers to seek further medical attention if a patient from a COVID-19 endemic area presents with anosmia and ageusia. At present, there is no sufficient evidence to support the fact that COVID-19-associated anosmia and ageusia is temporary; however, the development of self-administered common cold olfactory screening tests or checking the taste of food could be helpful in self-isolation during the acute phase of the disease. Furthermore, because COVID-19 can involve the brain through the cribriform plate in proximity to the olfactory bulb, especially the cortex, basal ganglia, and midbrain, patients with anosmia/hyposmia should undergo thorough evaluation regarding involvement of the

central nervous system.^{20,21} Further studies are warranted to determine the pathophysiology of the association of COVID-19 with anosmia and ageusia.

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