Anosmia and the Need for COVID-19 Screening During the Pandemic

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Abstract

In this Commentary, we briefly summarize the available data from Iran and other countries on the sudden increase in anosmia, hyposmia and hypogeusia that has coincided with COVID-19 pandemic. Alarmingly, a high proportion of patients with severe COVID-19 had isolated anosmia as the sole initial presenting symptom, which is likely due to direct neuropathic effect of the virus rather than secondary to nasal congestion and obstruction. Since isolated anosmia is not yet considered a prerequisite for screening for COVID-19, we wish to raise awareness on the association of anosmia with COVID-19, urging the international/national health authorities to consider this association in the efforts for early detection and isolation of the infected individuals and breaking the chain of transmission. We urge our colleagues who assess the patients with new-onset anosmia to strictly adhere to the safety guidelines to reduce the risk of exposure and infection during this nascent pandemic.
During the weeks leading to February 20th, 2020, when the first official reports of COVID-19 were documented in Iran; ear, nose and throat (ENT) surgeons have noticed a sudden surge in the number of patients presenting with anosmia. Anosmia in this cohort of patients was peculiar in that it was mostly isolated, and in a minority of patients accompanied by upper respiratory symptoms. Intriguingly, most patients reported a sudden loss of smell without any accompanying symptoms, while the remainder of patients continued to evolve from initial mild upper airway symptoms to typical symptoms of COVID-19.

Facing an unprecedented rise in the number of patients presenting with anosmia, the ENT Research Center of the Medical Council of Iran conducted a cross-sectional study of 13,623 patients with isolated anosmia (1). Out of these cases, there were respiratory symptoms in 8849 of the patients or their immediate families, suggesting a possible link between the sudden increase in anosmia and COVID-19 epidemic in Iran. Moreover, 83% of patients with anosmia also reported hypogeusia. The onset of anosmia was sudden in 76%, and 61% reported no change in anosmia over time. Surprisingly, 48% of the family members of the patients also reported hyposmia or anosmia, 12% of which had a history of severe respiratory disease consistent with probable COVID-19 (1).

Anosmia was not a common symptom in the early reports from the initial epicenter of COVID-19 in Wuhan, China. Nonetheless, hypogeusia (5.6%) and hyposmia (5.1%) in isolated subsequent reports were the telltale signs of possible peripheral neuropathy caused by the virus (2). Direct invasion of the olfactory nerve by severe acute respiratory syndrome (SARS)-CoV-2 could be supported by prior studies during the SARS-CoV epidemic in 2002-2003, where viral particles were isolated almost exclusively in the central nervous system (CNS) (3). Furthermore, nasal introduction of SARS-CoV or Middle Eastern Respiratory Syndrome (MERS)-CoV in
transgenic mice led to thalamus and brainstem involvement, probably via the olfactory nerves, surprisingly without any signs of upper respiratory airway involvement (4). Indeed, CNS infection by SARS-CoV was an independent prognostic factor for mortality (5).

Based on these prior observations, and putative neurotropism of SARS-CoV-2 (6), we speculate that SARS-CoV-2 may directly invade the brain via olfactory neuroepithelium, manifesting as loss or change of smell. Furthermore, since the world health organization (WHO) announced COVID-19 a global pandemic, other countries have been reporting a similar rise in ageusia and anosmia, especially in younger patients with mild symptoms (7). Crucially, from the public health standpoint, asymptomatic or mildly symptomatic carriers play a significant role in the COVID-19 transmission. Indeed, this group of patients with non-documented subclinical disease are thought to be the source of infection in 79% of documented cases (8). These characteristics of SARS-CoV-2 may explain the rapid geographic distribution and the exponential growth of the disease during the pandemic.

Considering the dynamics of COVID-19 transmission, strategies aiming to break the chain of transmission and flattening the pandemic curve need to focus on the early detection and self-isolation (home quarantine) of the infected individuals. Isolated anosmia is not currently considered by the WHO or the national health authorities as a prerequisite for screening by the polymerase chain reaction (PCR) test. We suggest that, during this pandemic, patients reporting new-onset anosmia should be considered positive for COVID-19 infection until proven otherwise by a screening PCR test. Since the viral load is higher in the nasopharynx than oropharynx in both symptomatic and asymptomatic patients (9), we recommend sampling by nasopharyngeal rather than oropharyngeal swabs in order to minimize the rates of false negative tests. Lastly, we urge the clinical care providers, in particular the ENT surgeons, who assess the
patients with new-onset anosmia during the COVID-19 pandemic to strictly follow the safety guidelines to reduce the risk of exposure and infection of the health care workers (10).

References


