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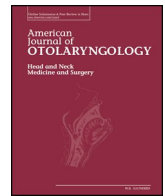
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Upper airway symptoms in coronavirus disease 2019 (COVID-19)

Dear Editor,

A novel member of human RNA coronavirus was newly identified in Wuhan, China. International Committee on Taxonomy of Viruses (ICTV) officially named it as Severe Acute Respiratory Syndrome-Coronavirus-2 (SARS-CoV-2) [1]. World Health Organization (WHO) recently named the disease caused by SARS-CoV-2, as Coronavirus Disease 2019 (COVID-19). Clinical evidence has demonstrated that this virus was transmissible from person to person [2]. SARS-CoV-2 cases increased rapidly in Wuhan and Hubei Province and extended with transmission chains throughout China. Outside China, imported cases and secondary cases have been reported in many countries and territories, and WHO declared COVID-19 outbreak a pandemic on March 11th, 2020 [3]. In Italy, we are experiencing a constant increase of infected patients and there is now concern regarding the Italian national health system's capacity to effectively respond to the needs of patients who are infected and require intensive care for SARS-CoV-2 pneumonia [4]. On March 27th, 2020 in Italy, 66,414 patients tested positive to the virus, 36,653 (55.2%) were isolated at home, 26,029 (39.2%) were hospitalized and 3732 (5.6%) were admitted to intensive care unit [5].

Very recently, Sky News reported that two National Health Service ENT consultants were receiving critical care after contracting SARS-CoV-2 [6]. These colleagues most likely acquired the infection from exanimated patients during their daily clinical work [6]. Considering that the most likely route of transmission of SARS-CoV-2 is by contact and respiratory droplets (aerosols), over short distances (1.5 m) [7], ENT examination stands at high risk for transmission of the virus to healthcare providers. Otolaryngologists should be accurately informed on COVID-19 in order to identify suspected cases. According to a very large case series from the Chinese Center for Disease Control and Prevention (72,314 cases, updated through February 11, 2020), more than 80% of COVID-19 cases presented mild symptoms [1]. In this report, the authors stated that cough and fever were very frequent but did not describe all presenting complaints [1]. COVID-19 commonly presented with fever, cough, and fatigue [2]; at now, little attention has been paid to upper airway symptoms. Considering case series of less than 150 patients, sore throat was reported in 5% [8], 11% [9], or 17.4% [10] of COVID-19 patients. In a larger series of 1099 COVID-19 patients, Guan et al. [2] found pharyngodynia in 13.9% of cases. In the same report, nasal congestion was present in 4.8% of COVID-19 patients [2], similarly to what it was found by Chen et al. (4% of cases) [8]. It is rational that COVID-19 entails pharyngeal and nasal complaints, including rhinorrhea [8]. In fact, the standard for detection of SARS-CoV-2 are real-time reverse-transcriptase polymerase-chain-reaction (RT-PCR) assays collected by nasal and oropharyngeal swabs, meaning that virus load in these sites should be high [7].

Olfaction alterations remain an open issue. One of the first warnings on the subject came from Dr. Ebrahim Razmpa, a deputy chairman of

Iran's Rhinology Association [11]. He reported that "During the last month there is a sudden, unexpected and unbelievable jump in cases of weak sense of smell"; the increase was initially attributed to diffuse exposure to chemicals in washing and disinfecting materials, which were used more frequently as a preventive measure against SARS-CoV-2 [11]. Professor Claire Hopkins, the President of British Rhinological Society, recently reported that "There is already good evidence from South Korea, China and Italy that significant numbers of patients with proven COVID-19 infection have developed anosmia/hyposmia" [12]. On March 22nd, 2020, the American Academy of Otolaryngology - Head and Neck Surgery stated that anosmia and dysgeusia has been reported by patients ultimately testing positive for SARS-CoV-2, and proposed to add these symptoms to the list of screening tools for possible COVID-19 infection [13]. A first survey on olfactory and taste disorders was conducted on COVID-19 hospitalized patients at Hospital Sacco (Milan, Italy): between 59 interviewed patients, 33.9% reported at least one taste or olfactory disorder and 18.6% both alterations [14]. Post-viral anosmia was one of the leading causes of loss of sense of smell in adults, accounting for up to 40% cases of anosmia [15], and it should not be a surprise if SARS-CoV-2 would also cause anosmia in infected patients. Previous studies have shown the ability of SARS-CoV to cause neuronal death in mice by invading the brain via the nose close to the olfactory epithelium [16]. The human Coronavirus 229E has already been isolated in nasal discharge from one patient with post-viral olfactory dysfunction [17]. SARS-CoV-2 exploited the angiotensin-converting enzyme 2 (ACE2) receptor to gain entry inside the cells, similar to SARS-CoV [18]. The brain has been reported to express ACE2 receptors that have been detected over glial cells and neurons [18].

As otolaryngologists, we should further investigate the upper airway symptoms in relation to COVID-19. Clinical presentation could be helpful in identifying suspected COVID-19 cases that should be isolated (use of individual rooms was recommended, with negative pressure if possible) [19]. Professor Claire Hopkins claimed that "if any adult with anosmia but no other symptoms was asked to self-isolate for seven days, in addition to the current symptom criteria used to trigger quarantine, we might be able to reduce the number of otherwise asymptomatic individuals who continue to act as vectors" [12]. Furthermore, there is evolving evidence that otolaryngologists are among the highest risk group of contracting the virus while performing upper airway procedures and examinations if not using appropriate Personal Protective Equipment (PPE) [20]. The American Academy of Otolaryngology - Head and Neck Surgery [21], the Confederation of European Otorhinolaryngology - Head & Neck Surgery [22], the British Association of Otorhinolaryngology [23], the French [24] and Italian [25] ENT societies have already published recommendations for the use of PPE during upper airways examinations, endoscopy, or during surgical interventions (e.g. tracheostomy).

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