

Demographic characteristics of patients with anosmia consulting to the COVID-19 outpatient clinic

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Ethics Committee Approval

The study was approved by the Ministry of Health and the Ethics Committee at Kartal Dr Lütfi Kırdar City Hospital (date: June 11, 2020, number: 2020/514/179/8).

All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

Conflict of Interest

No conflict of interest was declared by the authors.

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Abstract

Background/Aim: Coronavirus disease 2019 (COVID-19) cases first emerged in Turkey in March 2020, spreading rapidly and peaking in April and May. This study aimed to assess individuals with loss of taste and smell who were admitted to our hospital with a COVID-19 diagnosis.

Methods: Between March and June 2020, we retrospectively assessed 6966 patients who visited Kartal Dr. Lütfi Kırdar City Hospital's Infectious Diseases and Clinical Microbiology COVID-19 outpatient clinics; 137 patients with loss of taste and smell were included in the study. We enrolled 18-year-old patients who were admitted to the infection emergency outpatient clinics.

Results: Out of the 6966 patients hospitalized with a pre-diagnosis of COVID-19 infection, 137 (0.19%) complained of poor taste and smell. Among these, 69 (50.4%) were female, and 68 (49.6%) were male. Of the 137 patients, 100 (73%) reported a loss of smell, while 94 (68.6%) reported a loss of taste. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) RT-PCR (reverse transcriptase-polymerase chain reaction) was positive in approximately one-third (n=2672, 38.4%) of the 6966 patients and roughly half (n=62, 48.4%) of the patients with loss of taste and smell. The most common symptoms observed in patients with anosmia were fever (n=123, 91%), cough (n=102, 75%), shortness of breath (n=411, 30%), sore throat (n=12, 9%), malaise (n=12, 9%), myalgia (n=11, 8%), nausea/vomiting (n=6, 5%), diarrhea (n=4, 3%), loss of smell (n=2, 2%), and loss of taste (n=2, 2%). Comorbidities included hypertension (n=4, 3%), diabetes mellitus (n=4, 2%), chronic obstructive pulmonary disease (n=2, 2%), and coronary artery disease (n=1, 1%).

Conclusion: Patients admitted to our hospital during the initial wave of the pandemic experienced typical and prevalent symptoms such as fever, cough, shortness of breath, sore throat, and loss of taste and smell. Further large cohort studies are required to address the "tasteless" COVID-19 more fully.

Keywords: COVID-19, inability to smell, inability to taste

Introduction

Late in 2019, the coronavirus disease (COVID-19) first emerged in Wuhan, China, and subsequently spread rapidly [1]. Recently, the World Health Organization (WHO) classified COVID-19 as a public health emergency of global concern. Coronaviruses (CoV) are responsible for 5-10% of all acute respiratory infections. The causative agent of the COVID-19 pandemic, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is an enveloped, RNA-stranded beta coronavirus. The infection can present with various clinical manifestations, from asymptomatic cases to multi-organ dysfunction [2-4].

In addition to the common symptoms of COVID-19 disease, such as fever, dry cough, fatigue, shortness of breath, sore throat, headache, chest pain, diarrhea, nausea/vomiting, conjunctival congestion, and nasal congestion, individuals may also experience olfactory and taste dysfunction [4,5].

SARS-CoV-2 primarily infects the respiratory epithelium, similar to many other respiratory viruses. Both symptomatic and asymptomatic patients show higher viral loads in the nasal cavity than the pharynx, indicating that the nasal cavity is the primary point of infection.

The taste buds, located in various types of taste papillae on the tongue, palate, throat, and larynx, are innervated by the third cranial nerve. Olfactory chemoreceptor cells, which are bipolar nerve cells, reside in the olfactory mucosa, a unique area in the nasopharynx. SARS-CoV-2 affects the olfactory neuroepithelium through its binding to the respiratory epithelium. The virus enters the respiratory epithelium via airborne droplets, and there are also possibilities of transmission through the fecal-oral route and direct contact with bodily fluids [4,6].

The primary host cell receptor for SARS-CoV-2 is angiotensin-converting enzyme-2 (ACE-2), which is crucial in virus entry and infection. ACE-2 is expressed in the oral mucosa, and the tongue's epithelial cells contain high levels of this receptor [7-9]. This study aimed to assess patients with COVID-19 disease who presented with olfactory and gustatory impairment.

Materials and methods

A retrospective evaluation was conducted on 6966 individuals over the age of 18 who had been assessed with a pre-diagnosis of COVID-19 infection in the emergency outpatient clinic of our hospital. Among them, 137 individuals who reported a loss of taste and smell were included in the study. The inclusion criteria comprised patients above the age of 18 who were admitted to the infection emergency outpatient clinics. Data on age, gender, underlying illnesses, symptoms, and PCR positivity status of the study patients were retrospectively obtained from the hospital's automated system. The severity of COVID-19 was visually assessed for each of the five lung lobes on a scale from 0 to 5, based on the following definitions: 0 for no involvement, 1 for 5%, 2 for 5–25%, 3 for 26–49%, 4 for 50–75%, and 5 for >75% involvement [10]. Patients were contacted by phone to collect information about their general condition and symptoms. The study received approval from the Ministry of Health and the Ethics Committee at Kartal Dr Lutfi Kırdar City Hospital before its commencement (date: June 11, 2020, number: 2020/514/179/8).

Statistical analysis

Statistical analyses were conducted using IBM SPSS 18.0 (SPSS Inc., Chicago, USA). The significance level for this study was set at P -value <0.05. Descriptive statistical methods were employed to examine the research data, including counts, percentages, means, medians, and standard deviations.

Results

There were 137 patients, comprising 69 females (50.4%) and 68 males (49.6%). The mean age was 35.3 (ranging from 18 to 60) in females and 33.3 (ranging from 19 to 55) in males. There was no statistically significant difference in age between males and females ($P=0.325$). Taste complaints were reported by 100 patients (73%), while 94 (68.6%) experienced gustatory impairment and 53 (38.7%) had olfactory impairment (this percentage refers to the percentage of the whole sample and not just the women). SARS-CoV-2 RT-PCR was positive in 62 patients (48.4%). Other respiratory pathogens were not screened in these patients; hence, additional illnesses were not ruled out.

When the patients were contacted by phone and questioned about the duration of their loss of sense of smell and taste, it was found that the average period for smell loss was 18.5 days and for taste loss was 18.4 days.

The most common symptoms observed in patients with anosmia were fever ($n=123$, 91%), cough ($n=102$, 75%), shortness of breath ($n=41$, 30%), sore throat ($n=12$, 9%), malaise ($n=12$, 9%), myalgia ($n=11$, 8%), nausea/vomiting ($n=6$, 5%), diarrhea ($n=4$, 3%), loss of smell ($n=2$, 2%), and loss of taste ($n=2$, 2%). Among the comorbidities, hypertension was present in four patients (3%), diabetes mellitus in four patients (2%), chronic obstructive pulmonary disease in two patients (2%), and coronary artery disease in one patient (1%).

A radiologist thoroughly reviewed thorax computed tomography (CT) scans, and CT scores [10] were calculated. Common CT findings such as ground-glass areas, consolidations, the connection between ground-glass areas and consolidations, and vascular dilatation were identified. Atypical CT findings included septal thickening, air bronchogram, pleural effusion, inverted halo, fibrosis nodules, and mediastinal lymphadenopathy (LAP) findings [10]. Among the 5484 patients who underwent thoracic CT, 4113 (75.2%) showed radiological involvement. SARS-CoV-2 RT-PCR positivity resulted in 3315 (80.6%) positive tests and 798 (19.4%) negative tests. Laboratory values were as follows: white blood cell count: $7242 \times 10^3/\mu\text{L}$, lymphocyte count: $2158 \times 10^3/\mu\text{L}$, hemoglobin: 13.8 mg/dL, platelet count: 255,000 mg/dL, CRP (C-reactive protein): 10 mg/dL, creatinine: 0.9 mg/dL, AST (aspartate aminotransferase): 32 U/L, ALT (alanine aminotransferase): 39 U/L, and troponin I: 0.002 ng/mL (Table 1).

Table 1: Laboratory values of patients with anosmia symptom

Parameters	Mean (n=137)	Min-Max
White blood cell ($10^3/\mu\text{L}$)	7242	4500-7700
Lymphocyte ($\times 10^3/\mu\text{L}$)	2158	510-3500
Hb (mg/dL)	13.8	12.8-17.8
Platelets (mg/dL)	255,000	166,000-455,000
CRP (mg/dL)	10	3-8
AST (U/L)	32	11-159
ALT (U/L)	39	7-236
Creatinine (mg/dL)	0.9	0.03-6.2
Troponin I (ng/mL)	0.003	0.001-0.09

Discussion

Olfactory dysfunction has emerged as a new symptom of COVID-19, particularly with the spread of the European pandemic. Interestingly, this symptom was not frequently reported in most of the early studies conducted in China and still remains highly prevalent in COVID-19 patients in China, occurring only in 5% of all patients [10,11]. In March 2020, the American Society of Otolaryngology-Head and Neck Surgery stated that COVID-19-positive patients frequently describe symptoms of anosmia and dysgeusia and should be included in the screening criteria for COVID-19 [12].

According to Zayet et al. [13], patients with a positive SARS-CoV-2 RT-PCR test showed a 77% prevalence of anosmia, and 83% had both anosmia and taste disorder. Some patients who test negative for COVID-19 but experience anosmia and taste abnormalities might still have a COVID-19 infection, and this possibility should not be ruled out. Smell and taste abnormalities are increasingly common in COVID-19-positive patients. In various case series, the reported prevalence of olfactory dysfunction ranges from 5.14% to 98.33%, while the reported prevalence of taste dysfunction ranges from 5.61% to 92.65% [14].

Anosmia and ageusia were observed in 5.1% and 5.6% of the COVID-19-positive individuals included in the study, respectively [15]. In a case series focusing on the senses of taste and smell, dysfunction of at least one sense was observed in 19.38% of the cases, which is consistent with our findings [16]. However, Bénézit et al. [17] reported higher percentages, with 75% experiencing olfactory abnormalities and 92.65% reporting taste abnormalities.

The highly varying numbers can be attributed to several factors, such as the presence of taste and smell impairment, the evolving pathogenicity of different SARS-CoV-2 strains in the nasal cavity, and the diversity of strains across different countries. Smell and taste disturbances have emerged as important symptoms of COVID-19, affecting approximately 40% of outpatients. These symptoms serve as crucial markers of infection. During the early stages of the pandemic, our study did not extensively inquire about these symptoms, resulting in their underreporting. However, their prevalence increased as we proactively questioned patients [18,19].

In a retrospective investigation by Klopfenstein et al., it was found that 54 (47%) out of 114 confirmed COVID-19 patients experienced anosmia. The study also revealed that patients developed anosmia on average 4.4 days after the onset of SARS-CoV-2 infection, which typically lasted for 8.96 days, with 98% of patients recovering within 28 days [6].

In our research, COVID-19 PCR was positive in 62 (48.4%) out of 137 patients with anosmia. We contacted each patient individually to inquire about the duration of their smell and taste loss, which was reported to have an average duration of 18.5 days and 18.4 days, respectively. Additionally, several investigations have consistently shown that the incidence of smell problems in COVID-19-positive cases is higher in female patients than male patients [19-21]. In our study, out of the 137 anosmia patients, 69 (50.4%) were female, and 68 (49.6%) were male. There was no significant difference in age between men and women.

Conclusion

During the initial wave of the pandemic, patients admitted to our hospital exhibited typical and commonly prevalent symptoms, including fever, cough, shortness of breath, sore throat, and loss of taste and smell. However, further investigation using large cohort studies is necessary to comprehensively understand the phenomenon of “tasteless” COVID-19.

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