Oral and Facial Manifestations of COVID-19

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Abstract

Objective: To review the oral and facial manifestations of COVID-19 which may be useful in the prompt diagnosis of the disease.

Materials and Methods: Literatures were searched from renowned electronic databases like PubMed, Medline, Google scholar and Cochrane Library. The following words were used for the search. “Oral and facial manifestations of COVID-19.”

Results: The SARS-CoV-2 virus is transmitted from human to human via droplet transmission and direct contact with oral, nasal, and eye mucous membranes. Studies suggest that COVID-19 may become airborne through aerosols generated during clinical procedures. The most common symptoms of coronavirus disease are fever, tiredness, dry cough and difficulty breathing. Other atypical symptoms, such as muscle pain, confusion, headache, anosmia, dysgeusia, sore throat, diarrhea, and vomiting have been reported, and seem to be on the rise.

Conclusion: It will be interesting to determine in the near future how frequent those manifestations are in individuals presenting symptoms in contrast to infected asymptomatic patient, and their usefulness in defining the outcome of COVID-19.

Keywords: Coronavirus, COVID-19, SARS-CoV-2, Orofacial manifestations.

Introduction

The outbreak of coronavirus disease 2019 (COVID-19) in the area of Wuhan, China, has evolved rapidly into a public health crisis and has spread exponentially to other parts of the world[1,2]. The novel coronavirus belongs to a family of single-stranded RNA viruses known as Coronaviridae[3]. This family of viruses are known to be zoonotic or transmitted from animals to humans. These include severe acute respiratory syndrome coronavirus (SARS-CoV), first identified in 2002, and the Middle East respiratory syndrome coronavirus (MERS-CoV), first identified in 2012[4]. On March 11, 2020, the World Health Organization (WHO) declared the rampant spread of SARS-CoV-2 and its associated disease (COVID-19) a global pandemic.

The epidemiological pattern of COVID-19 suggests an incubation period of five to fourteen days with a case report suggesting as high as twenty-four days[5]. The mode of transmission of the SARS-CoV-2 virus is via respiratory droplets; but has also been found in blood and stool. Transmission by contact such as contact with nasal, oral, and ocular mucous membranes has also been reported. SARS-CoV-2 may also be transmitted directly or indirectly by the saliva, and the fetal–oral routes can be a possible route of person-to-person transmission as well[5,6].

Dentists are among the highest risk categories for transmission and contraction of the coronavirus, with many routine dental procedures having the potential to transmit the virus through aerosols. Asymptomatic (carrier) patients as well as patients with an acute

respiratory illness may present for dental treatment at outpatient dental settings[7]. Although patients diagnosed with COVID-19 are not supposed to receive dental treatments, dental emergencies are possible to occur, thereby, a close contact is unavoidable[4,8].

Some studies[9,10] have reported that majority of patients experienced fever and dry cough, while some also had shortness of breath, fatigue, and other atypical symptoms, such as muscle pain, confusion, headache, sore throat, diarrhea, and vomiting. A recent study[5] on COVID-19 patients in Nigeria reported the following findings: 'Regarding the presenting symptoms of the patients, the most common ones were fever (59%) and dry cough (44%). Anosmia (loss of smell) and ageusia (loss of taste) was experienced by an equal proportion of patients (19% respectively).

It is not surprising COVID-19 has oral manifestations, since many other viral infections also have similar presentations[11]. Some common orofacial manifestations of viral infection may contribute to early diagnosis of COVID-19 infection. It will be interesting to determine in the near future how frequent those manifestations are in individuals presenting symptoms in contrast to infected asymptomatic patients, and their usefulness in defining the outcome of COVID-19. This article thus presents the oral and facial manifestations of COVID-19.

Materials and Methods

Literatures were searched from renowned electronic database like PubMed, Medline, Google scholar and Cochrane Library. The following words were used for the search. “Oral and facial manifestations of COVID-19. A total of 30 articles were reviewed including original studies, case studies and literature reviews.

Discussion

Orofacial Manifestations of Covid-19:

Changes in Salivary Gland and Saliva: Studies have shown the presence of SARS-CoV-2 in both saliva and faeces of the affected patients[12,13]. It is known that SARS-CoV-2 can bind to human angiotensin-converting enzyme 2 receptors, which are highly concentrated in salivary glands; this may be a possible explanation for the presence of SARS-CoV-2 in secretory saliva[14,15]. Therefore, there is a potential for transmission of COVID-19 via aerosol, fomites, or the faecal-oral route that may contribute to nosocomial spread in the dental office setting[4,16]. In a study[10], the 2019 novel coronavirus (2019-nCoV) was detected in the self-collected saliva of 91.7% of patients. Serial saliva viral load monitoring generally showed a declining trend. Live virus was detected in saliva by viral culture.

Saliva is a promising noninvasive specimen for diagnosis, monitoring, and infection control in patients with 2019-nCoV infection. Because saliva can be provided by patients without any invasive procedures, the use of saliva specimens will reduce the risk of nosocomial transmission of 2019-nCoV and is ideal for situations in which nasopharyngeal specimen collection may be contraindicated[12]. The positive rate of COVID-19 in patients' saliva can reach 91.7%, and saliva samples can also cultivate the live virus. This suggests that COVID-19 transmitted by asymptomatic infection may originate from infected saliva. Therefore, the cause of asymptomatic infection might be from salivary glands[8,10].

Taste Dysfunction: Altered taste sensation has been recognized lately as one of the symptoms of COVID-19 in several studies among patients with the disease[4,5,17]. It could be in the form of loss of taste (ageusia) or altered taste sensation (dysgeusia). In a previous study[17], sixty-seven patients (52%) reported changes in taste sensation; fifty-two patients reported a change in their spicy taste perception, 54 had change in salty taste, 53 change in sour taste, and 61 change in sweet taste. In a comparison between men and women, taste change and change in taste subgroups were more common among women, with no significant statistical difference. An Italian team reported that 20 out of 59 COVID-19 patients who were interviewed, 33.9% had at least one taste or olfactory disorder and 11 (18.6%) had both[16]. Taste and smell disorder in this case could be explained by the fact that SARS-CoV-2 has been known for its interaction with angiotensin converting enzyme 2 (ACE2) receptor, to facilitate its penetration into the cell, and this receptor is widely expressed on the epithelial cells of oral mucosa and the brain[7]. It was indicated that of those who reported loss of taste, the loss was typically profound, not mild. But encouragingly, the rate of recovery of taste was high and occurred usually within two to four weeks of infection[18].

Dentists should be aware of this symptom since they may encounter patients with taste abnormalities in the form of dysgeusia or burning mouth syndrome. This is particularly important because these symptoms may precede the onset of respiratory diagnostic manifestations of the disease.

Olfactory Disorder: Olfactory dysfunction was reported in a study[16] in eighty-six (67%) patients during the disease, and 19.5% reported anosmia, which was more frequent among women. Olfactory dysfunction was more common during the third through fifth days of the illness, with no statistical

difference between the sexes. Kaye et al.[19] in a previous study reported anosmia as the first symptom among more than approximately 25% of COVID-19 patients. Olfactory impairments can be classified into conductive losses stemming from obstruction of the nasal passages and sensori-neural causes from damage to the olfactory neuroepithelium, which are most often attributed to postviral olfactory loss[20,21]. Mao et al.,[22] reported the presence of neurologic manifestations among COVID-19 patients who were hospitalized in Wuhan, China, in 2019. Smell and taste impairment were the most frequently reported peripheral nerve symptoms. In a study[23] where a total of 1480 patients with influenza-like symptoms underwent COVID-19 testing, smell and taste impairment were independently and strongly associated with COVID-19 positivity, and these chemosensory impairments were at least 10-fold more common in COVID-19–positive cases. Of those who reported olfactory dysfunction, the loss was typically profound rather than mild. Recent reports[17,24] demonstrated that loss of taste and smell can be the first and only manifestations of infection.

Xerostomia: Taste is the main stimulant for saliva formation. In a study[16], more than 50% of COVID-19 patients reported dysgeusia and xerostomia, which were significantly correlated, supporting this mechanism. Previous studies[16,23] showed that xerostomia is secondary to nasal congestion and rhinorrhea due to mouth breathing. This condition may be explained by olfactory dysfunction or may suggest neurological involvement that may lead to dysgeusia and xerostomia. A common manifestation of xerostomia is a burning sensation.

Headache: Headache may be a key symptom of COVID-19 that predicts the disease's clinical evolution in individual patients[25]. An observational study of more than 100 patients showed that headache onset could occur during the presymptomatic or symptomatic phase of COVID-19 and could resemble tension-type or migraine headache[25]. Another study[22] reported that headache is the most frequent neurologic symptom in COVID-19. A report established that neurologic manifestations appeared in 36% of COVID-19 patients. Dizziness (16.8%) and headache (13.1%) were the more frequent, followed by peripheral nervous system symptoms (8.9%), impaired consciousness (7.5%), and acute cerebrovascular disease (2.8%)[26]. Interleukin-6 (IL-6), one of the main inflammatory molecules, has been proven to be related to COVID-19 and has become a therapeutic target. Levels of IL-6 may be lowered and tend to be more stable in patients with both COVID-19 and headache than in patients with COVID-19 only.

Other Orofacial Manifestations of COVID-19: Other manifestations of COVID-19, although not commonly reported are facial pain with a number of studies[16,27] showing that facial pain is more common in women than men, and sore throat. The sore throat was reported to be present in 5% to 17.4% of COVID-19 patients[6,28]. Also, a recent study[29] presented a 45-year-old female patient who presented with an irregular ulcer on the dorsal side of the tongue. History of the lesion revealed 24-hour painful inflammation of a tongue papilla, followed by 24 hour erythematous macula, which evolved into irregular and asymptomatic ulcer. After 10 days, the ulcer completely healed without scar. This irregular oral ulcer could be an inaugural symptom of COVID-19 which needs to be proven in larger cohorts of patients. Severe COVID-19 acute infection, along with associated therapeutic measures, could potentially contribute to negative outcomes with regard to oral health, likely leading to various opportunistic fungal infections, xerostomia linked to decreased salivary flow, ulcerations and gingivitis as a result of impaired immune system and/or susceptible oral mucosa. It is worth noting that cytokine storm caused by dysregulated humoral and cellular mechanisms can aggravate existing autoimmune conditions within the oropharyngeal area[30].

Conclusion

The orofacial manifestations of COVID-19 are still being researched, however the few features that have been established can aid in the diagnosis, monitoring, and infection control of patients with COVID-19. These oral and facial manifestations would help to increase awareness, and to allow for early detection of infection with SARS-CoV-2.

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