



ORIGINAL RESEARCH PAPER

Oral Medicine

ORAL MANIFESTATION IN COVID 19: A REVIEW

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ABSTRACT

Coronavirus disease 2019 (COVID-19) has spread exponentially across the globe. The typical manifestations of COVID-19 include fever, dry cough, headache and fatigue. However various atypical manifestations are also being increasingly reported, out of which oral manifestations play a major role. This review highlights various oral manifestation of covid infection, knowledge of which will help in prompt diagnosis and better management of covid patients.

INTRODUCTION:

The novel coronavirus or severe acute respiratory syndrome corona virus 2 was first detected in Wuhan city in Central China and presents an important and urgent threat to global health [1]. SARS-CoV-2 is a single-stranded, positive-sense RNA virus, believed to originate from bats. The gold standard for its diagnosis is nucleic acid analysis of respiratory tract samples, through RT-PCR. SARS-CoV-2 is mainly transmitted through respiratory droplets and direct contact; however, the gastrointestinal tract, saliva, urine, and ocular secretions have also been suggested as potential routes, requiring further investigation [2,3]. Symptoms of COVID-19 include fever, fatigue, sore throat, cough, dyspnea, headache, myalgia, abnormality in olfactory/gustatory senses, gastrointestinal issues, and less commonly, skin lesions [4]. Apart from these, a considerable number of reports have highlighted oral cavity among various extra- respiratory sites that have shown manifestations in COVID- 19 patients[5].

The major concern during a pandemic is the identification of the infectious source. Considering that SARS-CoV-2- positive patient is one of the main sources of infection of COVID-19, it is important to know all the symptoms and major and minor manifestations of the disease in order to help obtain an early diagnosis. Orophysicians are the first-line diagnosticians who can identify the oral symptoms associated with this pandemic.

Gustatory and olfactory dysfunction

Various studies have reported that nasal cavity harbors greater load of virus than pharynx suggesting that nasal cavity could be the first gateway of infection. Depending upon geographic location of the study, olfactory and gustatory dysfunctions ranging from 5 to 88 % have been reported in COVID patients, out of which loss of taste (ageusia) and smell (anosmia) are the two symptoms most commonly seen. A study by Giacomelli et al., found either taste or olfactory disorders in 34% of patients with COVID-19 and 18.6% had both[6]. Fantozzi et al. conducted a survey of 326 COVID-19 patients with confirmed SARS-CoV-2 infection and reported that dysgeusia was the most common symptom (59.5%), followed by xerostomia (45.9%) and olfactory alterations (hyposmia/anosmia, 41.4%)[7]. According to Center for Disease Control and prevention, the key symptoms suggestive of COVID-19 infection include altered gustatory and olfactory perception. Alterations in taste sensation in COVID-19 ranges from decreased sensitivity (hypogeusia), taste confusion (dysgeusia), or complete loss of taste (ageusia)[8].

Xerostomia

Dry mouth has also been reported as a common symptom in COVID patients. The infection of salivary gland cells by SARS-

CoV-2 finally results in destruction of salivary acinar cells and the impaired saliva-production function.⁸ Yifan et al reported xerostomia among 10 most frequently encountered symptoms in covid patients[9].

Oral mucosal lesions

Aphthous-like lesions:

Another common manifestation seen in COVID patients is appearance of aphthous-like ulcers on the both keratinized and nonkeratinized mucosa. A retrospective analysis conducted by Riad et al. detailed the presentation of aphthous stomatitis in 21 patients with COVID-19 and it was reported that ulcerations were more common on the buccal mucosa (33.3%), followed by tongue (14.3%), lower lip (14.3%), upper lip (14.3%), gingiva (9.5%), palate (9.5%), and both of palate and gingiva (4.8%)[10].

Herpetiform/zosteriform lesions:

Herpetiform lesions presented as multiple painful, round yellowish-gray ulcers with an erythematous rim on the both keratinized and non-keratinized mucosae. Stress and immunosuppression associated with COVID-19 was suggested as cause for appearance of secondary herpetic gingivostomatitis [11].

Geographic tongue:

A geographic tongue-like lesion has also been reported in covid-19 patients. The higher expression of ACE2 and TMPRSS2 on the tongue epithelial cells may result in easy destruction and depapillation of filiform and fungiform papillae from the dorsal surface of the tongue resulting in geographic tongue[12].

Ulcer and erosion

Ulcerative or erosive lesions appeared as painful lesions with irregular borders on the tongue, hard palate, and labial mucosa. Lesions appeared after a latency time of 4 to 7 days and in one case, lesions appeared 3 days before the onset of systemic symptoms and recovered after 5 to 21 days. In two cases, PCR for HSV-1 and HSV-2 was performed and was negative. Different factors including drug eruption (to NSAID in one case), vasculitis, or thrombotic vasculopathy secondary to COVID-19 were suggested as causes for development of ulcerative and erosive lesions[11].

White/red plaques

White and red patches or plaques were reported on dorsum of tongue, gingiva, and palate of patients with confirmed or suspected COVID-19. This could be due to deterioration of general status, long-term antibiotic therapy and decline in oral hygiene. Corchuelo and Ulloa diagnosed oral candidiasis and white and red plaques at the posterior border of the tongue. Exaggerated cytokine release and disturbances in

cellular immune response may be responsible for fungal coinfections[13].

Angina bullosa-like lesions

In a case report of Cruz et al., Angina bullosa-like lesion was noted presenting as an erythematous purple blister which appears asymptomatic on the tongue and hard palate of two patients with COVID 19 infection[14].

Melkersson-Rosenthal syndrome

There was a report of a 51-year-old woman presenting with complaint of malaise and unilateral lip swelling, fissured tongue and right facial paralysis. She had past history of Melkersson-Rosenthal syndrome since 4 years ago that was spontaneously cured with no relapse. Lab- oratory data demonstrated an increased level of CRP and computed tomography (CT) scan showed ground-glass opacities in both lungs. The patient cured completely after treatment of COVID-19 disease [15].

Atypical sweet syndrome

There was a report of 61-year-old female who presented complaining of fever, fatigue, arthralgia, myalgia, several erythematous nodules on the scalp, trunk and extremities, and minor aphthous ulcers on the hard palate and buccal mucosa. RT-PCR for COVID-19 was positive. Skin biopsy showed diffuse neutrophilic infiltration in the upper dermis with granulomatous infiltration in the lower dermis and subcuta- neous area that was compatible with erythema nodosum-like Sweet syndrome [16].

Kawasaki-like disease

Oral lesions including cheilitis, glossitis, and erythematous and swollen tongue (red strawberry tongue) appeared in COVID-19 patients with Kawasaki-like disease (Kawa-COVID).The long duration of latency between appearance of systemic symptoms (respiratory or gastroin- testinal) and onset of oral or cutaneous symptoms could be due to a delayed hyperactivation response of the immune system and secondary release of acute inflammatory cytokines rather than direct effects of virus on the skin and oral mucosa [17].

Necrotizing periodontal disease

There was a report of a 35-year-old female suspicious for COVID-19 who presented with fever, submandibular lymphadenopathy, halitosis, and oral lesions. Oral lesions included a painful, diffuse erythematous and edematous gingiva with necrosis of inter-papillary areas. The suggested diagnosis was necrotizing periodontal disease due to bacterial coinfections (especially prevotella intermedia) along with COVID- 19.The lesions recovered after 5 days [18].

Salivary gland diseases

Recent studies have enunciated salivary gland involvement in COVID-19 infection. A study by Chen et al. assessed ACE2 receptor expression in the epithelial cells of salivary gland and found the incidence of nCoV-2019 infection in the salivary glands. Decreased secretion of saliva associated with pain and tumor in the parotid and submandibular glands gradually caused the infections and stones in salivary ducts which could be an early manifestation associated with COVID 19 infections [8].

DISCUSSION:

Dental practitioners can play a major role in the early diagnosis and referral of affected patients and hence prevent the disease transmission. According to the researchers, the presence of ACE2 receptors in the oral mucosa might be the cause for taste alteration in patients with SARS-CoV-2 [8].Chemosensory dysfunction can occur as a separate entity or in combination. The exact pathophysiological mechanism leading to gustatory dysfunction in COVID-19 infection is yet unclear. Cyclic adenosine monophosphate, a universal second messenger has a key role in signal transduction of taste and smell. SARS-CoV-2

virus utilizes cyclic adenosine triphosphate (cAMP) for replication in oral and olfactory mucosa resulting in depleted level of cAMP and thereby resulting in taste and smell alterations in patients with COVID-19, hence utilized as a therapeutic target by preventing viral replication and thereby improving chemosensory dysfunction.

Some reports suggested the relevance of stress induction and immunosuppression in patients with COVID-19 resulting in impaired immune system that could potentially contribute to opportunistic fungal infections, recurrent oral herpes simplex virus-1 infection, and herpetic gingivostomatitis. Necrotizing periodontal disease was observed in patients diagnosed with COVID-19. Metagenomic analyses of patients with SARS-CoV-2 frequently detected high bacterial loads of Prevotella intermedia, a major causative agent for several acute periodontal lesions, along with Fusobacterium and Treponema species [19].

CONCLUSION:

The need of the hour is to emphasize the importance of educating dental professionals for early diagnosis and better prognosis. Dentists can also be a part of an effective surveillance network by notifying public health authorities about unusual oral symptoms or clinical presentations detected in questionable frequency in a population. Thus, dentists can facilitate the early detection of a disease outbreak or bioterrorism attack, and prevent mass casualties by prompt interventions.

REFERENCES:

1. Farid H, Khan M, Jamal S, Ghafoor R. Oral manifestations of Covid- 19- A literature review. Rev Med Virol. 2021; e2248
2. Guan WJ, Ni ZY, and Hu Y. "Clinical characteristics of coronavirus disease 2019 in China," e New England Journal of Medicine, vol. 382, pp. 1708-1720, 2020.
3. Freni F, Meduri A, Gazia F et al., "Symptomatology in head and neck district in coronavirus disease (COVID-19): a possible neuroinvasive action of SARS-CoV-2," American Journal of Otolaryngology, vol. 41, Article ID 102612, 2020
4. Ren YR, Golding A, Sorbello A et al., "A comprehensive updated review on SARS-CoV-2 and COVID-19," e Journal of Clinical Pharmacology, vol. 60, pp. 954-975, 2020.
5. Mogadam SE, Alaeddini M. Is SARS-CoV-2 an etiological agent or predisposing factor for oral lesions in covid -19 patients. A concise review of reported cases in literature. International journal of dentistry, vol 2021
6. Giacomelli A, Pezzati L, Conti F, et al. Self-reported olfactory and taste disorders in SARS-CoV-2 patients: a cross-sectional study. Clin Infect Dis 2020;71:889-90
7. Fantozzi PJ, Pampena E, Di Vanna D, et al. Xerostomia, gustatory and olfactory dysfunctions in patients with COVID-19. Am J Otolaryngol 2020;41:102721.
8. Karthika PS, Rathy R, Jayanthi P, Harish RK, Ameena M, Krishnasree RJ. Oral Manifestations of COVID-19 Patients: A Systematic Review. J Orofac Sci 2021;13:73-81
9. Yifan T, Ying L, Chunhong G, et al. Symptom cluster of ICU nurses treating COVID-19 pneumonia patients in Wuhan, China. J Pain Symptom Manage 2020;60:e43-53
10. Riad A, Kaseem I, Stanek J, Badrah M, Klugarova J. Aphthous stomatitis in COVID-19 patients: case series and review literature. Dermatologic Therapy 2021;34:e14735.
11. Iranmanesh B, Khalili M, Amiri R, Zartab H, Aflatoonian M. Oral manifestations of COVID-19 disease: A review article. Dermatologic Therapy. 2020; e14578.
12. Hathway RW. COVID tongue. Br Dent J 2021;230:114.
13. Corchuelo J, Ulloa FC. Oral manifestations in a patient with a history of asymptomatic COVID-19. Case Report Int J Infect Dis 2020;100:154-7
14. Cruz Tapia RO, Peraza Labrador AJ, Guimaraes DM, Matos Valdez LH. Oral mucosal lesions in patients with SARS-CoV-2 infection. Report of four cases. Are they a true sign of COVID-19 disease? Spec Care Dentist 2020;40:555-60.
15. Tashidere B, Mehmetaj L, Özcan AB, Gülen B, Tas lidere N. Melkersson-Rosenthal syndrome induced by COVID-19: a case report. Am J Emerg Med. 2020.
16. Taskin B, Vural S, Altu'g E, et al. COVID-19 presenting with atypical Sweet's syndrome. J Eur Acad Dermatol Venereol. 2020;34:e534-e535.
17. Iranmanesh B, Khalili M, Amiri R, Zartab H, Aflatoonian M. Oral manifestations of COVID-19 disease: A review article. Dermatologic Therapy. 2020; e14578.
18. Patel J, Woolley J. Necrotizing periodontal disease: oral manifestation of COVID-19. Oral Dis. 2020
19. Ummer H, Mohammed PK, Mohan R, Radhakrishna M, Honward S. Pathogenesis of gustatory and olfactory dysfunction in coronavirus disease 2019 patients: a neurophysiological hypothesis. Int J Sci Stud 2020;8:97-100.