ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at: www.ijmacr.com

Volume – 4, Issue – 6, November – December - 2021, Page No. : 75 – 80

Oral Manifestation of Covid-19: A Review

[1]Dr. Sulekha, MDS, Pediatric and Preventive Dentistry, Private Practitioner, Ramgarh, Jharkhand

[2]Dr. Anusuya Mishra, Senior Resident, Department of Pediatrics and Preventive Dentistry, S.C.B. Dental College and Hospital, Manglabag, Cuttack, Odisha

[3]Dr. Furkan Ahmed Khan, Senior Lecturer, Department of Prosthodontic Crown & Bridge, Sri Aurobindo College of Dentistry (SAU) , Indore, Madhya Pradesh

[4]Dr. Shantanu Sontakke, MDS, Public Health Dentistry, Dental officer, District hospital, Ujjain, Madhya Pradesh

[5]Dr Eknoor Kaur, Postgraduate Student, Department of Orthodontics and Dentofacial Orthopedics, Dasmesh Institute of Research and Dental Sciences, Faridkot

[6]Dr Pooja dhakad, Postgraduate Student, Department of Oral medicine and Radiology, Darshan Dental College and Hospital, Village Loyara, Ranakpur Road, Udaipur

Corresponding Author: Dr. Sulekha, MDS, Pediatric and Preventive Dentistry, Private Practitioner, Ramgarh, Jharkhand

How to citation this article: Dr. Sulekha, Dr. Anusuya Mishra, Dr. Furkan Ahmed Khan, Dr. Shantanu Sontakke, Dr Eknoor Kaur, Dr Pooja Dhakad, "Oral Manifestation of Covid-19: A Review", IJMACR- November – December - 2021, Vol – 4, Issue - 6, P. No. 75 – 80.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Novel Corona virus infections have caused a pandemic. Severe acute respiratory syndrome corona virus 2 (SARS-CoV-2), the agent, is a single-chain RNA virus that is the cause of novel corona virus disease known as COVID-19. The most common clinical symptoms seen are fever, headache, sore throat, shortness of breath, dry cough, abdominal pain, vomiting, and diarrhoea. Some patients reportedly present with oral manifestations of corona virus disease 2019. The aim of present review of literature is to discuss about oral manifestation of covid-19 in detail.

Keywords: SARS-CoV-2, COVID-19, Oral manifestation

Introduction

The World Health Organization named "2019 novel corona virus" on January 12, 2020 after its discovery in Wuhan, Hubei Province with the cluster of new types of viral pneumonia cases.[1] It is caused by a single positive stranded RNA virus from the corona virus (CoV) family of Coronaviridae. The mode of transmission of SARS-CoV-2 occurs by droplets or contact transmission. Saliva can carry a risk of transmission of COVID-19, either by direct contact or indirect contact with contaminated stuff.[2-4]

SARSCoV- 2, a single-stranded RNA virus, belonging to Coronaviridae family, is the causative agent of the disease. SARS-CoV-2 virus particles are spherical with spikes projecting from the surface, binds, and fuses to the human cells which allow the virus to gain entry. Angiotensin-converting enzyme 2 (ACE2) receptor permits the attachment of the virus, their fusion, intracellular entry, and infection. The disease primarily transmits via the respiratory droplets, and the signs and symptoms are apparent with an incubation period of 2 to 14 days, which include headache, fever, sore throat, dyspnea, dry cough, abdominal pain, vomiting, and diarrhea.[5-7]

At the start of the COVID-19 pandemic, it was assumed that lack of oral involvement is a distinguishing feature of COVID-19 exanthema as compared to other viral exanthemas. But recently, SARS-CoV-2 has been detected from saliva of the patients and it has been shown that reverse transcriptase-polymerase chain reaction (RT-PCR) from saliva can be a more sensitive test in comparison with nasopharyngeal swab testing. Also, now many newer manifestations are reported in these infections, and oral lesions are also commonly seen.[8] Present review of literature aims to discuss about oral manifestation of covid-19 in detail.

Pathophysiology of Covid-19

SARS-CoV-2 infection is caused by the binding of the viral surface spike protein to the human angiotensinconverting enzyme 2 (ACE2) receptor after activation of the spike protein by transmembrane protease serine 2. ACE2 appears to be the predominant portal of entry and is expressed in the lung (principally type II alveolar cells) and the heart as well, counteracting the effects of angiotensin II in states with excessive activation of the renin-angiotensin system, such as hypertension, congestive heart failure, and atherosclerosis. In addition, it is expressed in the intestinal epithelium, vascular endothelium, and kidneys, providing a mechanism for the multi-organ dysfunction that can be seen with SARSCoV- 2 infection.[9]

General manifestation of Covid-19

The clinical features of COVID-19 are varied, ranging from asymptomatic state to acute respiratory distress syndrome and multi organ dysfunction. The complete clinical manifestation is not clear yet, as the reported symptoms range from mild to severe, with some cases even resulting in death. The most commonly reported symptoms are fever, cough, myalgia or fatigue, pneumonia, and complicated dyspnea, whereas less common reported symptoms include headache, diarrhoea, haemoptysis, runny nose, and phlegm-producing cough. Patients with mild symptoms were reported to recover after 1 week while severe cases were reported to experience progressive respiratory failure due to alveolar damage from the virus, which may lead to death. Cases resulting in death were primarily middle-aged and elderly patients with pre-existing diseases (tumor surgery, cirrhosis, hypertension, coronary heart disease, diabetes, and Parkinson's disease).[10-12]

Oral Manifestations of Covid-19

Dysgeusia is the first recognized oral symptom. Gustatory disorders, sialadenitis, aphthous-like ulcerations, erosive macules, vesicle, pustule, bulla, papule, plaque, pigmentation, halitosis, xerostomia, whitish areas, fissured or depapillated tongue, hemorrhagic crust, necrosis, swelling, erythema, and spontaneous bleeding of the oral mucosa are often seen. The most common sites of involvement in descending order are tongue, labial mucosa, and palate. Oral lesions can be self-limiting and may resolve in 10 days.[9,13,14]

Taste and smell alterations

The most common symptoms of covid-19 are alteration of Taste and smell, presenting as anosmia. Anosmia is being considered as a marker for COVID-19 by reputed international medical entities such as the British Association for Otorhinolaryngology. In addition, there is a suggestion that patients with new-onset anosmia, even if they are asymptomatic for COVID-19, quarantine themselves in anticipation of the possible onset of COVID-19. This might help in reducing the further community spread of the disease. In Europe, 70% of the patients with Covid-19 showed olfactory and taste alterations. These manifestations could help in predicting the prognosis during the disease. Neurosensory recovery is rapid and complete in a large percentage of patients.[15,16]

Dry mouth

Dry mouth is a disorder that occurs due to insufficient saliva secretion or absolute salivary gland dysfunction.[17] Freni et al. (2020) reported the signs of xerostomia in 32% of the COVID-19 patients in their investigation. These researchers demonstrated that in most of the cases, xerostomia occurred before other symptoms of the disease, and the severity of this problem diminished after 15 days. [18]

According to the literature, the neuropathic and mucotropic effects of this virus can potentially affect the function of salivary glands and lead to hyposalivation and xerostomia.[19] Moreover; inflammatory and infectious procedures have been noted as factors influencing reduced saliva. As a result, the possibility of quantitative and qualitative salivary disorders due to SARS-CoV-2 infection in the salivary gland should be taken into consideration.[20]

Consuming numerous medicines and diverse pharmacological groups is among other reasons suggested for xerostomia in COVID-19. The most common medications in patients with COVID-19 include antiviral agents (remdesivir), hydroxychloroquine, anti-HIV medications (ritonavir, lopinavir) and interferons. Overall, medications are the most frequent reason for xerostomia. Among the common medicines for COVID-19 treatment, lopinavir, ritonavir and interferons play a remarkable role in xerostomia.[17]

Oral candidiasis

The immune dysregulation triggered by SARS-CoV-2 infection has been hypothesized as a causal pathway for the increasingly reported oral manifestations associated with coronavirus diseases, especially the ones of fungal origin such as candidiasis.

The most common complaints of patients having COVID associated candidiasis are burning sensation and dysphagia. White membranous patches are seen spread over the dorsum of the tongue or lateral border of the tongue or palate or even the buccal mucosa. Concomitant occurrence of xerostomia can cause dysphagia in such patients. Most often pseudomembranous candidiasis is manifested or erythematous atrophic candidiasis is seen which leads to a painful mouth in such patients. Candida colonisation is reported to be significantly associated with cognitive impairment, multiple co-morbidities, poor oral hygiene and in patients on long-term antibiotics and steroids. This opportunistic fungal infection is commonly seen in COVID-19 patients causing discomfort and inability to eat or swallow. The damage exerted by SARS CoV-2 among patients with Acute respiratory distress syndrome, may allow commensal Candida species to invade the internal organs of the affected patients.[21]

Oral mucosal lesions in Covid-19

Oral lesions in Covid-19 could be a direct manifestation of the infection, a manifestation of systemic deterioration,

or an adverse reaction to the treatment. Oral mucosal lesions in association with COVID-19 infection, including aphthous-like lesions, herpetiform/zosteriform lesions, ulcerations and erosions, white/red plaques, papules or vesicles, petechiae or macules in the oral cavity. Among the oral lesions reported, ulcerative lesions were the most common. The involvement of both keratinized and non-keratinized mucosa has been observed. Tongue was considered as the most common site of involvement followed by hard palate, buccal mucosa, lips, and gingiva. The complete remission of the oral symptoms occurred within 21 days.[22,23]

Table 1: Type oral mucosal lesions in Covid-19

- Ulcerative lesions (Aphthous-like ulceration, Herpetic stomatitis, Non-specific ulcers, and Erythema multiform)
- Tongue changes (Geographic tongue, Red or swollen tongue, Strawberry tongue, Fissured tongue, Macroglossia, and Coated tongue)
- Haemorrhagic lesions (Angina bullosa, Mucosal vasculitis, Thrombosis, Petechiae, Haemorrhagic ulcer, Focal erythema, and Spontaneous oral haemorrhage)
- Gingival lesions (Desquamative gingivitis, Necrotising ulcerative gingivitis, and Papillary hyperplasia)
- Candidal lesions (Oral pseudomembranous candidiasis and Unspecified candidiasis)
- Oral lichenoid lesions
- Oral enanthema
- Non-specific blisters
- Mucositis

Discussion

Dental professional can play a major role in the early diagnosis and referral of affected patients and hence prevent the disease transmission. The review attempts to explain the association between various oral manifestations and SARS-CoV-2.[24]

The characteristic clinical symptoms of COVID-19 patients were high temperature, cough, sore throat, dyspnea, and muscle pain, with abnormal chest CT, whereas the less dominant symptoms were sputum secretion, headache, haemoptysis, and gastrointestinal disturbance. In progressive cases, pneumonia, myocardial damage, coagulation dysfunction, encephalopathy, organ failure, and death. A great number of studies reported that the mouth is one of the extra respiratory places that have shown manifestations in COVID-19 patients. Moreover, recent reports revealed that xerostomia, change of taste and smell which might arise before the conventional signs of COVID-19 may represent as the first and only manifestations of the virus.[25]

The common oral manifestations in patients suffering from COVID-19 are various forms of ulcerations, inflammation of oral mucosal tissues, loss of taste, smell and Candidial colonization. Gingival inflammation along with bleeding gums is noted in the majority of COVID-19 patients which may manifest as one of the early signs of the disease. This could be attributed to a lack of maintenance of oral hygiene during the disease state leading to biofilm production and bacterial colonization causing gingivitis and bleeding gums. High expression of ACE2 receptors in oral mucosal tissues could also be the contributory factor for inflammation of gingival tissues.[26]

Although oral lesions appear during the illness with COVID-19, it has not been possible to determine whether they were complications of the disease, or related to medical care or pre-existing medical conditions of the patients. Perhaps in severe cases of COVID-19 when

intubation was required, the lack of minimal oral hygiene standards could also have resulted in oral lesions. Other potential confounding factors include trauma secondary to intubation, coexisting medical conditions such as diabetes or immunosuppression, vascular complications, and opportunistic or secondary infections, which may have led to a number of oral manifestations.[27]

Conclusion

The principal oral manifestations of Covid-19 are dysgeusia, anosmia, and ulcers, which may be associated with the patient's systemic diseases or the administration of drugs. There is need of more longitudinal studies aimed to explain oral manifestation due to corona virus, and clarify the mechanisms of the development of these oral lesions because there is no confirmed evidence to prove that the described petechiae, ulcers, and vesiculobullous lesions represent intraoral signs of SARS-CoV-2 infection.

References

1. Jin YH, Cai L, Cheng ZS, Cheng H, Deng T, Fan YP, et al. A rapid advice guideline for the diagnosis and treatment of 2019 novel coronavirus (2019-nCoV) infected pneumonia (standard version). Mil Med Res 2020;7:4.
2. Ludwig S, Zarbock A. Coronaviruses and SARSCoV-2: A brief overview. Anesth Analg 2020; 31:93-96.
3. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. Intern. J of Oral Sci, 2020,12(1), 1–6.
4. Speth MM, Singer-Cornelius T, Obere M, et al. Olfactory dysfunction and sinonasalsymptomatology in COVID-19: Prevalence, severity, timing, and associated characteristics. Otolaryngol Head Neck Surg 2020; 163:114–120.
5. Hoffmann M, Kleine-Weber H, Schroeder S, et al. SARS-CoV-2 cell entry depends on ACE2 and TMPRSS2 and is blocked by a clinically proven protease inhibitor. Cell 2020;181:1-10.
6. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with2019 novel coronavirus in Wuhan, China. Lancet 2020;395:497-506.
7. Chen N, Zhou M, Dong X, et al. Epidemiological and clinical characteristics of 99 cases of2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet 2020;395:507-13.
8. Bhattacharyya SG, Bhattacharyya S. Oral Manifestations of Covid-19 In Children and Adults. Inter Ped Dent Open Acc J 5(5)-2021. IPDOAJ.MS.ID.000225
9. Saurabh S, Miyajiwala JS, Paul S, Arya S, Gogoi A, Soni J. Coronavirus disease and its oral implications: A diagnostic realm. Int J Oral Care Res 2021;9:93-5.
10. CDC. 2019 Novel coronavirus, Wuhan, China. 2020. https://www.cdc.gov/coronavirus/2019-nCoV/summary.html. Accessed 1 Feb 2020.
11. Li T, Wei C, Li W, Hongwei F, Shi J. Beijing Union Medical College Hospital on "pneumonia of novel coronavirus infection" diagnosis and treatment proposal (V2.0). Med J Peking Union Med Coll Hosp. 2020. http://kns.cnki.net/kcms/detail/11.5882.r.20200130.1430.002.html. Accessed 2 Feb 2020.
12. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. N Engl J Med. 2020. https://doi.org/10.1056/NEJMoa2001316.
13. Sinadinos A, Shelswell J. Oral ulceration and blistering in patients with COVID-19. Evid Based Dent 2020;21:49.

14. Kumar KS, Venkitachalam R, Verma B. Oral medicine practice during COVID-19: A scoping review. J Indian Acad Oral Med Radiol 2021;33:215-21
15. Thomas DC, Baddireddy SM, Kohli D. Anosmia: A review in the context of coronavirus disease 2019 and orofacial pain. J Am Dent Assoc. 2020 Sep;151(9):696-702. doi: 10.1016/j.adaj.2020.06.039. Epub 2020 Jul 1. PMID: 32854871; PMCID: PMC7328601.
16. Chary E, Carsuzaa F, Trijolet JP, Capitaine AL, Roncato- Saberan M, Fouet K, et al. Prevalence and recovery from olfactory and gustatory dysfunctions in Covid-19 infection: A prospective multicenter study. Am J Rhinol Allergy 2020;34:686-93.
17. Fathi Y, Hoseini EG, Atoof F, Mottaghi R. Xerostomia (dry mouth) in patients with COVID-19: a case series. Future Virol. 2021 Mar:10.2217/fvl-2020-0334. doi: 10.2217/fvl-2020-0334. Epub 2021 Apr 6. PMCID: PMC8023012.
18. 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. Am. J. Otolaryngol. 41(5), 102612 (2020).
19. Dziedzic A, Wojtyczka R. The impact of coronavirus infectious disease 19 (COVID-19) on oral health. Oral Dis. 27(S3), 703–706 (2020).
20. Pedrosa MDS, Sipert CR, Nogueira FN. Salivary glands, saliva and oral findings in COVID-19 infection. Pesqui. Bras. Odontopediatria Clín. Integr. 20(supp1), e0104 (2020).
21. Saxena S, Kumar S. Understanding the mechanism of commonly occurring COVID-19-associated oral lesions. J Oral Maxillofac Pathol 2021;25:223-5.
22. Seirafianpour F, Sodagar S, Pour Mohammad A, et al. Cutaneous manifestations, and considerations in COVID-19 pandemic: a systematic review. Dermatol Ther 2020;33:e13986.
23. Amorim dos Santos J, Normando AG, Carvalho da Silva RL, et al. Oral manifestations in patients with COVID-19: a living systematic review. J Dent Res 2020;0022034520957289.
24. Amorim Dos Santos J, Normando AGC, Carvalho da Silva RL, De Paula RM, Cembranel AC, Santos-Silva AR, et al. Oral mucosal lesions in a COVID-19 patient: New signs or secondary manifestations? Int J Infect Dis 2020;97:326-8.
25. Surana P., et al. “Covid 19 - A New Normal for Dentistry during Pandemic”. Acta Scientific Dental Sciences 4.12 (2020).
26. Manzalawi R, Alhmamey K, Abdelrasoul M. Gingival bleeding associated with COVID-19 infection. Clin Case Rep 2021;9:294-7
27. Bhujel N, et al. Oral mucosal lesions in patients with COVID-19: a systematic review. Br J Oral Maxillofac Surg (2021), https://doi.org/10.1016/j.bjoms.2021.06.011