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Review Article

Oral Manifestations of Covid-19 In Children and Adults

Satarupa Ghosal Bhattacharyya[1] and Sayan Bhattacharyya[2]*

[1]*BDS, Dentist, India*

[2]*Assistant Professor, Department of Microbiology, AIIH&PH, India*

***Corresponding author:** Sayan Bhattacharyya, Department of Microbiology, AIIH&PH, India

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Abstract

COVID-19 has caused a pandemic and it still going quite strong. This disease has many general or constitutional manifestations, among which oral manifestations can also be present. These manifestations are often non-specific and can occur in any viral infections as well. Hence, they have to be recognized distinctly by the dentist as well as Laboratory personnel. So here we have tried to collect available data regarding this, in the form of a review.

Keywords: COVID-19; Oral; aphthous; tongue

Introduction

Novel Coronavirus infections have caused a pandemic. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the agent, is a single-chain RNA virus that is the cause of novel coronavirus 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 diarrhea(1). 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 exanthems. 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 [1]. Also, now many newer manifestations are reported in these infections, and oral lesions are also commonly seen.

Materials and Methods

Thorough scientific literature search was done to collate available information regarding this.

Oral lesions and COVID-19 infection

Oral manifestations of COVID-19 include ulcers, erosion, bullae, vesicles, pustule, fissured or depapillated tongue, macule, papule, plaque, pigmentation, halitosis, whitish areas, haemorrhagic crusts, necrosis, petechiae, swelling, erythema, and spontaneous bleeding. The most common sites of involvement in descending order are tongue (about 38%), labial mucosa (about 26%), and palate (about 22%)(1). Oral lesions are nearly equally found in both genders (49% female and 51% male). Patients with older age and higher severity of COVID-19 disease have more widespread and sever oral lesions. Lack of oral hygiene, opportunistic infections, stress, immunosuppression, vasculitis, and hyper-inflammatory response secondary to COVID-19 are the most important predisposing factors for onset of oral lesions in COVID-19 patients [1]. Other types of lesions are also found, like lesions on the tongue, palate, and commissure compatible with pseudomembranous candidiasis and angular cheilitis [2]. In another study, gustatory or taste impairment was the most common oral manifestation, with a prevalence of 45% [3]. The pooled eligible data in this study, for different taste disorders were 38% for dysgeusia and 35% for hypogeusia, while ageusia had a prevalence of 24%. Oral mucosal lesions presented multiple clinical aspects, including white and erythematous plaques, irregular ulcers, small blisters, petechiae, and desquamative gingivitis. Tongue, palate, lips, gingiva, and buccal mucosa were affected. In mild cases, oral mucosal lesions developed before or at the same time as the initial respiratory symptoms; however, in those who required medication and hospitalization, the lesions developed approximately seven to 24 days after onset symptoms [3].

How and why oral lesions appear in COVID-19

Latest research shows that Coronavirus invades human cells via the receptor angiotensin-converting enzyme 2 (ACE2) as seen by scRNA-seq data analysis [4]. The study identified the organs that are at risk and are vulnerable to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, like lungs(4). So, cells with high ACE2 receptor distribution can become host

cells for the virus and cause inflammatory response in related organs and tissues, like the tongue mucosa and salivary glands [4]. SARS-CoV-2 interaction with ACE2 receptors may also impair taste bud sensitivity, which could induce dysfunctional gustatory responses [4]. As regards other oral lesions seen in CIVOID-19 like unspecific oral ulcerations, desquamative gingivitis, petechiae, and coinfections such as candidiasis, however, it is still unclear whether these manifestations could be a typically clinical pattern resulting from the direct SARS-CoV-2 infection or a systemic consequence, given the possibility of coinfections, impaired immune system, and adverse reactions of medical treatment [4].

More about the loss of taste

Firstly, the peripheral nervous system is affected by the new coronavirus, and as gustatory buds are innervated by cranial nerves, related functions may be impaired, resulting in taste disorders [4]. Secondly, SARS-CoV-2 may bind essential salivary mucin components, such as sialic acid, consequently accelerating taste particle degradation and disturbing gustatory sensation [4,5]. Furthermore, ACE2 high expression was demonstrated in the taste buds of rats and was associated with angiotensin II production in mice taste buds. These findings might also point to the inability of ACE2 to break down this protein during COVID-19 infection, resulting in the erratic taste responses [4]. Overall, the global prevalence of taste disorders in patients with COVID-19 is 45%. Researchers have also found with some degree of evidence that taste disorders are associated with COVID-19 positivity, mild/moderate severity of disease and female gender.

Other lesions

Other lesions like irregular ulcers are also sometimes observed on dorsum of tongue ion some patients, which could be explained by vasculitis that occurs in COVID-19 infection [6].

Clinical dilemma in children

Although much is still unknown about the full-fledged effects of COVID-19, literature from the early stages of the COVID-19 pandemic (spring and summer 2020) shows a post-viral immunologic reaction resulting in a multisystem inflammatory syndrome in children (MIS-C) [7]. The case definition of MIS-C according to the Centers for Disease Control and Prevention (CDC) is a patient lesser than 21 years of age with fever, laboratory evidence of inflammation, and clinical evidence of severe illness requiring hospitalization, including involvement of 2 or more organ systems. These patients also should be positive for SARS-CoV-2 infection, confirmed either by reverse transcription polymerase chain reaction (RT-PCR), serology, or antigen testing, and should not have any other imminent cause of their symptoms [7]. Interestingly, oral mucous membrane changes also appear to be an important finding in MIS-C(7).It can be confused with Kawasaki disease, which can present in children with Strawberry tongue [7]. The intraoral findings in a child affected by the disease are usually nonspecific which can be due to the milder form of COVID-19 in children [8]. There is not much literature yet available that delineate the intraoral findings in a COVID positive child. Paediatric dentists should therefore be vigilant while examining COVID positive children due to the paucity in information [8]. Also, children are generally asymptomatic carriers of COVID-19, and so universal precautions should always be followed by pedodontists [9]. Many dental treatments are aerosol generating procedures (AGPs), which have been associated with the transmission of acute respiratory infections. In addition, dental settings are more likely to have a high number of potentially contaminated surfaces such as dental chairs, their handles, the spittoon, and dental instruments after carrying out a treatment which are possible routes of transmission. SARS-CoV-2 virus can survive well on surfaces for up to 72 hours, and all clinic surfaces should hence be disinfected by chemicals recommended for eliminating SARS-CoV-2 [9].

Diagnostic challenges

Other viral diseases can also cause mucosal lesions in mouth cavity or enanthems, like Chikungunya which causes Aphthous-like ulcers and oral lesions similar to Koplik's spots(10). Dengue fever can produce Gingival bleeding and gingival and lip swelling(10). In Ebola virus infection, there can be Gingival bleeding, white or red patches, aphthous-like ulcers and greyish exudative lesions [10,11]. Even in mild infections like Hand, foot and mouth disease caused by Echoviruses and Coxsackie virus types A and B, painful ulcers can be encountered in oral cavity(12). Hence these have to be kept in mind while detecting oral lesions of COVID-19.

Use of Imaging

Imaging, especially MRI, can help in detecting Parotitis as cited by some researchers, since this also occurs commonly in children having COVID-19 [13].

Newer avenues

Tele dentistry can also be used effectively in the COVID-19 pandemic to minimize patient-doctor physical contact. Tele dentistry (a part of telehealth along with telemedicine) is the remote facilitating of dental care, guidance, education or treatment through the use of information technology rather than through direct face-to-face contact with any patient(14). The techniques comprise Teleconsultation that reduces referrals, Telediagnosis using Mobile Mouth Screening Anywhere (MeMoSA) and Whatsapp, Teletriage for management and Telemonitoring [14]. However, both dentists and patients should be comfortable with these new techniques and give consent also for these.

Discussion

Enanthema can develop in various types of viral diseases including dengue fever disease, Ebola virus disease, herpangina, human herpes virus (HHV) infections, measles, and roseola infantum [1]. Infectious diseases, especially of viral etiology, constitute approximately 88% of causes of enanthema. Different types of

enanthema , like aphthous-like ulcers, Koplik's spots, Nagayama's spot, petechiae, papulovesicular, or maculopapular lesions, white or red patches, gingival and lip swelling have been reported with various viral infections. Both keratinized (hard palate, gingiva, and dorsum of tongue) and non-keratinized (labial and buccal) mucosae can be affected [1,6]. Covid-19 has a huge range of clinical manifestations and due to the high number of patients involved, the diagnosis is often based on clinical findings or suspicions [6]. Thus, proper suspicion can help in picking up the cases actively and effectively. Diagnosis can be aided by Radiology and tele technology. Clinicians need to be especially vigilant in children regarding this.

Conclusion

Hence COVID-19 can cause many oral and mucosal lesions that have to be correctly identified. Proper clinical suspicion might be present, and dentists must try to exclude COVID-19 infection whenever unexplained ulcers or loss of taste are seen along with other constitutional symptoms. Children with COVID-19 have nonspecific or minimal symptoms or can have oral lesion as part of multi-system, disorders, and hence clinicians should be alert.

References

1. Iranmanesh B, Khalili M, Amiri R, Zartab H, Aflatoonian M (2021) Oral manifestations of COVID-19 disease: A review article. Dermatol Ther 34(1): 14578.
1. Díaz Rodríguez M, Jimenez Romera A, Villarroel M (2020) Oral manifestations associated with COVID-19. Oral Dis.
2. COVID-19 – oral manifestations. Research Insights.
3. dos Santos JA, NB Ormando AGC, da Silva RLC, Acevedo AC, Canto GDL, et al. (2020) Oral Manifestations in Patients with COVID-19: A Living Systematic Review. J Dent Res 100(2): 141-154.
4. Milanetti E, Miotto M, Rienzo LD, Monti M, Gosti G, et al. (2020) In-silico evidence for two receptors-based strategy of SARS-CoV-2. bioRxiv 2020.
5. Chaux-Bodard AG, Deneuve S, Desoutter A (2020) Oral manifestation of Covid-19 as an inaugural symptom? J Oral Med Oral Surg 26: 18.
6. Halepas S, Lee KC, Myers A, Yoon RK, Chung W, et al. (2021) Oral manifestations of COVID-2019–related multisystem inflammatory syndrome in children: a review of 47 pediatric patients. J Am Dental Assoc 152(3): 202-208.
7. Koticha PB, Pradhan D, Katge F, Krishna V, Bhanushali P, et al. (2020) COVID-19 in Children: Its Impact on Oral Health and Paediatric Dentistry. International Journal of Science and Healthcare Research 5(3): 377-189.
8. Mallineni SK, Innes NP, Raggio DP, Araujo MP, Robertson MD, et al. (2020) Coronavirus disease (COVID-19): Characteristics in children and considerations for dentists providing their care. Int J Ped Dentistr 30(3): 245-250.
9. Rocha BA, Souto GR, de Mattos Camargo Grossmann S (2020) Viral enanthema in oral mucosa: a possible diagnostic challenge in the COVID-19 pandemic. Oral Dis 3: 776-778.
10. Scully C, Samaranayake LP (2016) Emerging and changing viral diseases in the new millennium. Oral Diseases 22(3): 171-179.
11. Castro MCR, Ramos-e-Silva M (2020) The rash with mucosal ulceration. Clinics in Dermatology 38(1): 35-41.
12. Halboub E, Al-Maweri SA, Alanazi RH, Qaid NM, Abdulrab S (2020) Orofacial manifestations of COVID-19: a brief review of the published literature. Braz oral res 34: e124.
13. Ghai S (2020) Teledentistry during COVID-19 pandemic. Diabetes Metab Syndr 14(5): 933-935.

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