

Assessment of Oral Mucosal and Periodontal Manifestations in COVID-19 Positive Patients: A Cross Sectional Study

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Abstract

Original Research Article

Background: Since 2021, there have been steadily increasing numbers of SARS-CoV-2 or novel coronavirus infection that causes COVID-19 disease. Some oral manifestations have been observed in patients with coronavirus during 2021(SARS- COV-2). **Methods:** This study was a Cross sectional study which was conducted at the department of Conservative Dentistry and Endodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, Bangladesh. This study conducts within 12 months. The sample size for this study was 100. **Result:** Age range of the patient was 21 to 69 years. The mean age of the patients was 54.7±12.5 years. Maximum 70.0% patients belong to age more than 50 years followed by 14.0% patients were in 41-50 years. 69.0% patients were male and 31.0% were female. Male: female ratio was 2:2:1. Male patients were predominant. 57.0% patients had acute oral ulcer, 36% patients had chronic ulcer and 7% recurrent oral ulcer. 64.0% patients had recurrent intra-oral petechiae, 20.0% patients had acute intra-oral petechiae and 16% patients had chronic intra-oral petechiae. 54.0% patients had chronic intra-oral vesicle/bullae followed by 41.0% patients had acute intra oral vesicle/bullae and 5% recurrent intra-oral vesicle/bullae. 94% patients had dryness of mouth. 97% patients had tongue whitish patches. **Conclusion:** We concluded that oral health status could have a potential impact on the severity of COVID-19 illness.

Keywords: Oral Mucosal, Periodontal Manifestations, Covid-19.

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INTRODUCTION

Since 2021, there have been steadily increasing numbers of SARS-CoV-2 or novel coronavirus infection that causes COVID-19 disease. World Health Organization (WHO) declared COVID-19 a global emergency on the 30th of January 2020 and, on the 11th of March 2020, declared it a pandemic when this highly contagious virus infected populations across the world. As of today, globally, over 10 millions of people have been infected and there have been over 7 lacs deaths attributed to the virus around the world due to this infection [1]. The most common signs and symptoms of SARS-CoV-2 infection include headache, sore throat, hyposmia, hypogeusia, diarrhoea, dyspnoea

and pneumonia. Some oral manifestations have been observed in patients with coronavirus disease 2019 (COVID-19). An article claimed to report an additional case of an oral condition in a patient diagnosed with COVID-19 and presented oral manifestations such as recurrent herpes simplex, candidiasis, and geographic tongue [2]. Another case series is reported where oral ulceration or blistering is found in patients with confirmed COVID-19. The authors suggest a link between COVID-19 and oral ulceration and blistering, but acknowledge about these signs may often go undetected due to a lack of intraoral examination during hospital admission [3]. Moreover, viral diseases may either occur due to cellular destruction or consequence of immune reaction following viral proteins. Oral

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features consist of mucosal ulcers, gingivitis even acute periodontitis followed after 2–3 days by the formation of vesicles that readily rupture, giving rise to painful ulcers covered with a yellowish membrane, which tend to coalesce. They are mainly localized to the lip, tongue, oral mucosa, palate and pharynx. The ulcers usually heal spontaneously after 10 days with no sequelae [4]. Furthermore, the majority of viral infections affecting the oral cavity are caused by the human Herpes Virus group. They are more likely to affect immunocompromised patients such as children and the elderly. Cytokines stimulate inflammatory cells, which results in destruction of the connective tissue alveolar bone [5]. Verrucae usually appear on the lips that is painless and singular [6]. The viruses play a fundamental role in the pathogenesis of periodontal diseases by direct cytopathic effect on inflammatory cells such as polymorphonuclear, leukocytes, lymphocytes, macrophages, and other cells such as fibroblasts, endothelial cells and even bone cells.

OBJECTIVE OF THE STUDY

The objective of this study was to determine the proportion of patients with oral manifestations in covid-19 positive/diagnosed patients.

MATERIALS AND METHODOLOGY

This study was a Cross sectional study which was conducted at the department of Conservative Dentistry and Endodontics, Faculty of Dentistry, Bangabandhu Sheikh Mujib Medical University

RESULT

Table-1: Distribution of the respondents by age (n=100)

Age group (years)	Frequency	Percent (%)
20-30	11	11.0
31-40	5	5.0
41-50	14	14.0
>50	70	70.0
Total	100	100.0
Mean \pm SD	54.7 \pm 12.5	
Range	(21 – 69) years	

Table-1 shows the age distribution of the study patients. Age range of the patient was 21 to 69 years. The mean age of the patients was 54.7 \pm 12.5 years.

(BSMMU), Shahbag, Dhaka, Bangladesh. This study conducts within 12 months. The sample size for this study was 100.

Inclusion Criteria

Patient having the following criteria includes into the study.

1. Covid-19 positive patients
2. Patient with sufficient mouth opening

Exclusion Criteria

Patient having the following criteria will be excluded from the study.

- Subject with previous infection history
- Subject with history of diabetic
- Subject with history of HIV
- Subject with history of malignancy
- Patients with trismus
- Mentally compromised patient
- Who are not willing to give examination

For this study, the data collector team was responsible for data collection using a checklist. The check list contained four sections which include socio-demographic characteristics, clinical feature of oral mucosal lesions, gingivitis evaluation index and signs-symptoms of acute periodontitis. Checklist will be used to collect data about medical history and clinical examination for assessment of the oral mucosal and periodontal manifestations.

Maximum 70.0% patients belong to age more than 50 years followed by 14.0% patients were in 41-50 years.

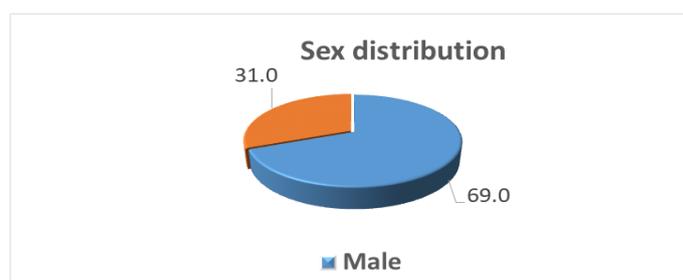


Figure-1: Sex distribution of the study respondents

Table-2 shows the sex distribution of the study population; 69.0% patients were male and 31.0% were

female. Male: female ratio was 2:2:1. Male patients were predominant.

Table-2: Distribution of the study patients by oral ulcer (n=100)

Type of Oral ulcer	Frequency	Percentage (%)
Acute	57	57.0
Chronic	36	36.0
Recurrent	7	7.0
Total	100	100.0

Regarding type of oral ulcer, maximum (57.0%) patients had acute oral ulcer, 36% patients had chronic ulcer and 7% recurrent oral ulcer.

Table-3: Distribution of the study patients by intra-oral petechiae (n=100)

Intra-oral petechiae	Frequency	Percentage (%)
Acute	68	68.0
Chronic	10	10.0
Recurrent	22	22.0
Total	100	100.0

Regarding type of intra-oral petechiae, maximum (64.0%) patients had recurrent intra-oral

petechiae, 20.0% patients had acute intra-oral petechiae and 16% patients had chronic intra-oral petechiae.

Table-4: Distribution of the study patients by intra-oral vesicle/bullae (n=100)

Intra-oral vesicle/bullae	Frequency	Percentage (%)
Acute	41	41.0
Chronic	54	54.0
Recurrent	5	5.0
Total	100	100.0

Regarding type of intra-oral vesicle/bullae, maximum patients (54.0%) patients had chronic intra-oral vesicle/bullae followed by 41.0% patients had

acute intra oral vesicle/bullae and 5% recurrent intra-oral vesicle/bullae.

Table-5: Distribution of the study patients by acute periodontitis (n=100)

Acute periodontitis	Frequency	Percentage (%)
Present	96	96.0
Absent	4	4.0
Total	100.0	100.0

Table showed that 96% patients acute periodontitis.

Table-6: Distribution of the study patients by dryness of mouth (n=100)

Dryness of mouth	Frequency	Percentage (%)
Present	94	94.0
Absent	6	6.0
Total	100	100.0

Table showed that 94% patients had dryness of mouth.

Table-7: Distribution of the study patients by tongue whitish patches (n=100)

Tongue whitish patches	Frequency	Percentage (%)
Present	97	97.0
Absent	3	3.0
Total	100	100.0

Table showed that 97% patients had tongue whitish patches.

DISCUSSION

The aim of the study is to determine the proportion of patients with oral manifestations in COVID-19 positive/diagnosed patients attends in BSMMU. The COVID-19 epidemic is a global health crisis, unlike any in modern history, which severely affects physical and mental health [7]. The relationship between SARS-CoV-2 and oral manifestations during the hospitalization. Several clinicians have observed many extrapulmonary manifestations of COVID-19. The three most common features of COVID-19 patients are bad breath, oral ulcer and gingival bleeding. The results of our survey show that the epidemic did effect psychological status and change living habits. Tooth brushing frequency did not significantly differ between the participants of the different region and age group. Every patients brush their teeth twice or more once a day. The result may be related to the fact that people might pay more attention to oral health care because of the in ability to seek timely dental treatment. Educational back ground and socioeconomic status may also be factors influencing oral health behaviors. The highest proportion of participants with a history of oral disease failed that the original disease had worsened during the epidemic. This outcome of dental treatment in that the majority of oral problems can only be solved by professional dental procedure. Most dental institution cannot provide regular dental services amidst the epidemic leading to the worsening of existing oral problems. Gingival bleeding, gingivitis, bad breath and oral ulcers were the three most common oral problems the study population encountered amid the epidemic. All three oral problems are associated with oral hygiene and psychological status has been proven to be an important risk factor for oral ulcers [8, 9]. To study the relationship between oral hygiene habits and oral disease further, we found that the prevalence of common oral diseases was the lowest among participants who brushed their teeth twice or more a day. All these findings suggest the importance of good oral hygiene behaviours and mental states in reducing the occurrence of oral diseases. Regarding type of oral ulcer, maximum (57.0%) patients had acute oral ulcer, 36% patients had chronic ulcer and 7% recurrent oral ulcer. Type of intra-oral petechiae found (64.0%) patients had recurrent intra-oral petechiae, 20.0% patients had acute intra-oral petechiae and 16% patients had chronic intra-oral petechiae. Regarding type of intra-oral vesicle/bullae, maximum patients (54.0%) patients had chronic intra-oral vesicle/bullae followed by 41.0% patients had acute intra oral vesicle/bullae and 5% recurrent intra-oral vesicle/bullae. Zhang *et al.*, (2021) reported the three most common oral problems amidst the epidemic were gingival bleeding (23%), bad breath (20%) and oral ulcers (17%) [9]. Martín Carreras-Presas *et al.*, (2020) reported different types of oral mucosal lesion (ulcer, vesicle, bulla, and desquamative gingivitis) that would be clinically similar as in other viral mucocutaneous infections, including

herpes simplex, herpes zoster, or immunologic disorders [10]. The oral lesions were self-limiting and the resolution was seen between 3 and 10 days after examination with symptomatic treatment. Recent publications of oral mucosa lesions related to COVID-19 support the association with organic damage and/or complications for thrombocytopenia, anticoagulant therapy, disseminated intravascular coagulation, and systemic inflammation [2, 11]. In this study observed that 96% COVID-19 patients had acute periodontitis, 94% patients had dryness of mouth, 97% patients had tongue whitish patches. Gonzalez *et al.*, (2020) reported seventy-eight patients (11.7%) had changes involving the oral mucosa [12]. The most common were transient anterior U-shaped lingual papillitis (11.5%) accompanied or not by tongue swelling (6.6%), aphthous stomatitis (6.9%), a burning sensation in the mouth (5.3%), mucositis (3.9%), glossitis with patchy depapillation (3.9%), white tongue (1.6%), and enanthema (0.5%). Most of the patients also reported taste disturbances. Iranmanesh *et al.*, (2020) reported oral manifestations included ulcer, erosion, bulla, vesicle, pustule, fissured or depapillated tongue, macule, papule, plaque, pigmentation, halitosis, whitish areas, hemorrhagic crust, necrosis, petechiae, swelling, erythema, and spontaneous bleeding [13]. The most common sites of involvement in descending order were tongue (38%), labial mucosa (26%), palate (22%), gingiva (8%), buccal mucosa (5%), oropharynx (4%), and tonsil (1%). Suggested diagnoses of the lesions were aphthous stomatitis, herpetiform lesions, candidiasis, vasculitis, Kawasaki-like, EM-like, mucositis, and drug eruption, necrotizing periodontal disease, angina bullosa-like, angular cheilitis, atypical Sweet syndrome, and Melkerson-Rosenthal syndrome. Oral lesions were symptomatic (painful, burning sensation, or pruritus) in 68% of the cases. Inadequate dental services and reluctance to go outside made tolerance the most popular choice for the participants facing oral problems. People chose to stay home as much as possible because of the official recommendation and fear of the epidemic. Although recent evidence suggests a relevant role of the oral cavity and its mucosae in the transmission and in the pathogenicity of SARS-CoV-2, as the entrance to the body of the virus, its protective or aggravating element for the infection and progression of the virus is still controversial.

CONCLUSIONS

We concluded that oral health status could have a potential impact on the severity of COVID-19 illness. Based on the findings of our present survey, we could conclude that individuals more seriously affected and suffered more oral problems. Keeping good oral health behaviours and mental status play an important role in preventing dental problems. It is crucial to establish and to follow the standard guidelines for the provision of dental care both during and after the

epidemic. Our research is a preliminary study of the impact of COVID-19 on oral health. This study is limited by the total sample size, and the population sampled may not be representative. More well-designed studies would contribute to a continuing understanding of this important issue.

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