ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)
IJDSIR : Dental Publication Service
Available Online at: www.ijdsir.com
Volume – 5, Issue – 1, February - 2022, Page No. : 115 - 121

The rising oral concerns in recovered covid patients

[1]Dr. Ruchita Thakkar, Post Graduate Student, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

[2]Dr. Nayana Patel, Professor and Head, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

[3]Dr. Radha Changela, Assistant Professor, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

[4]Dr. Nisha Verlianey, Assistant Professor, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

[5]Dr. Malav Sheth, Tutor, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

[6]Dr. Prerna Pandey, Post Graduate Student, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

Corresponding Author: Dr. Ruchita Thakkar, Post Graduate Student, Department of Periodontology, Government Dental College and Hospital, Jamnagar, Gujarat.

Citation of this Article: Dr. Ruchita Thakkar, Dr. Nayana Patel, Dr. Radha Changela, Dr. Nisha Verlianey, Dr. Malav Sheth, Dr. Prerna Pandey, "The rising oral concerns in recovered covid patients", IJDSIR- February - 2022, Vol. – 5, Issue - 1, P. No. 115 – 121.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Currently, the entire world is in the grip of a pandemic, the Novel COVID-19. The post COVID-19 entity is worth addressing because we are facing an unprecedented pandemic. Therefore, a better understanding of this entity might help the medical and dental community propose an adequate treatment that depends on the acknowledged pathophysiology.

Aim & Objectives: The aim of this study is to describe oral mucosal lesions in patients recovered from SARS CoV-2 infection and to establish their association with COVID-19 disease.

Materials and Method: A cross sectional study was conducted for oral assessment of recovered COVID 19 Patients in Jamnagar, Gujarat. A questionnaire consisting of 10 questions was filled by telephonic interview with the patient after the verbal consent of the patient. Patients reporting any oral problems on telephonic interview were examined after the consent of the patient.

Statistical methods: The categorical data was presented as frequencies and percentages and analyzed using Fisher's exact test. The significance level was set at $p \leq 0.05$ within all tests.

Results: A total of 681 patients (70% males, 30% females) in the age group of 13-90 years who recovered from COVID-19 in the month of August and September 2020 were included in the study. There was no statistically significant difference in age or gender between participants. The most prevalent symptom was altered taste sensation (6.31%), followed by toothache (3.37%), ulcer/any other painful lesion (1.61%), swelling/pain in gums (1.17%) and increase in tooth mobility (1.02%). While oral mucosal changes like dryness of mouth (0.58%) and burning sensation (0.73%) were less prevalent.

Conclusion: Based on limited data, COVID-19 significantly impacts the oral cavity and salivary glands, as oral symptoms and taste disorders are prevalent to some extent even after recovery in COVID-19 patients.

Keywords: Recovered, Covid -19, Oral manifestations, altered taste sensation.

Introduction

The recent spread of Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) and its associated corona virus disease has gripped the entire community and has caused widespread public health concerns. Once in the human body, this corona virus (SARS-CoV-2) is abundantly present in nasopharyngeal and salivary secretions of affected patients, and its spread is predominantly thought to be respiratory droplet/contact in nature.

The clinical course of COVID-19 depends on the host immune response, and frequent symptoms include fever, headache, malaise, cough, dyspnoea, loss of taste and smell; and other symptoms like diarrhoea, abdominal pain, confusion, lymphopenia, and hemodynamic disorders have been described. [1, 2]

SARS-CoV-2 binds to the angiotensin-converting enzyme 2 receptor (ACE2) receptor, which is detected in the cell membrane of numerous human organs and tissues including the lungs, kidneys, liver, epithelial cells of tongue and salivary glands, upper respiratory tract, nervous system and skeletal muscle among others. [3-6] The salivary gland and oral epithelium present the ACE2 receptor, a membranous protein used as a mechanism of attachment for SARS-COV-2, and due to this epithelial tropism, it is considered a route of viral latency and transmission. [7] In addition to that, a high viral discharge in the saliva and nasal secretion could be a pathogenic factor involved in the development of oral alterations associated with SARS-CoV-2 infection.

The post COVID-19 entity is worth addressing because we are facing an unprecedented pandemic. Recovered patients after acute COVID-19 illness may continue to experience oral problems. Therefore, a better understanding of this entity might help the medical and dental community propose an appropriate treatment that depends on the acknowledged pathophysiology.

Aim & objectives

The aim of this study is to describe oral manifestations in patients recovered from SARS CoV-2 infection and to establish their association with COVID-19 disease.

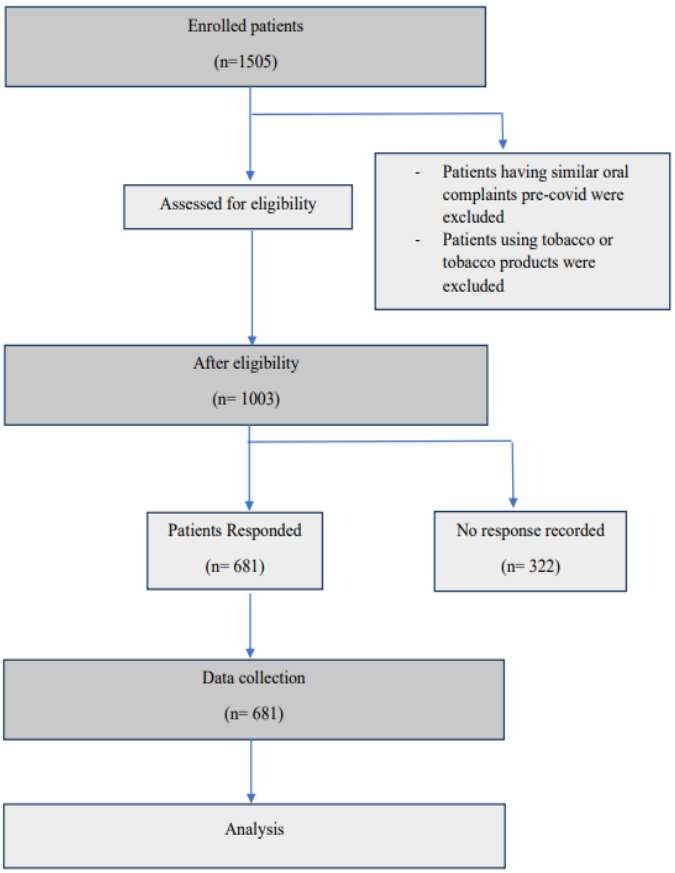
Materials and method

A cross-sectional study was conducted among 681 recovered covid patients in Jamnagar, Gujarat in the age group of 13–90 years. Ethical clearance was obtained from the institutional review board. All the patients recovered in the month of August- September 2020 from Covid-19 in Jamnagar, Gujarat were included in this study. Patients using tobacco or tobacco products,

smokers or those having similar oral complaints pre-covid were excluded from the study.

After reviewing the literature about the pathogenesis of Covid-19 and its related manifestations, a self-made questionnaire which had 10 dichotomous questions for oral health assessment of recovered Covid-19 patients was formulated. The questionnaire addressed the common oral findings like effective oral hygiene maintenance, bad odour, xerostomia, increased tooth mobility, swelling and pain in gums, burning sensation, ulcers, toothache, altered taste sensation and supplemental use of Mouthwash/ gargles. The questionnaire was filled by telephonic conversation in vernacular language after the verbal consent of the patient. Patients reporting any oral problems on telephonic interview were examined after the consent of the patient. The responses were collected and evaluated.

Study Design



Statistical methods

The categorical data was presented as frequencies and percentages and analyzed using Fisher's exact test. The significance level was set at $p \leq 0.05$ within all tests.

Results

A total of 681 patients (70% males, 30% females) (Figure 1) in the age group of 13-90 years (Figure 2) who recovered from covid in the month of August and September 2020 were included in the study. There was no statistically significant difference in age or gender between participants. (p- value = 0.91 and 0.95 respectively) (Table 1).

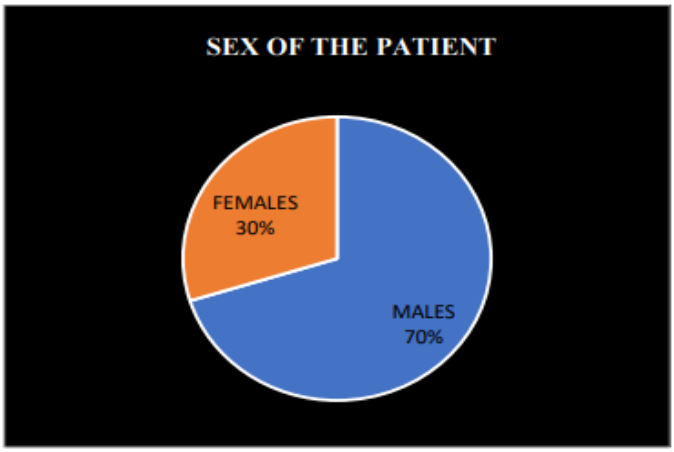


Figure 1: Distribution of study population based on sex

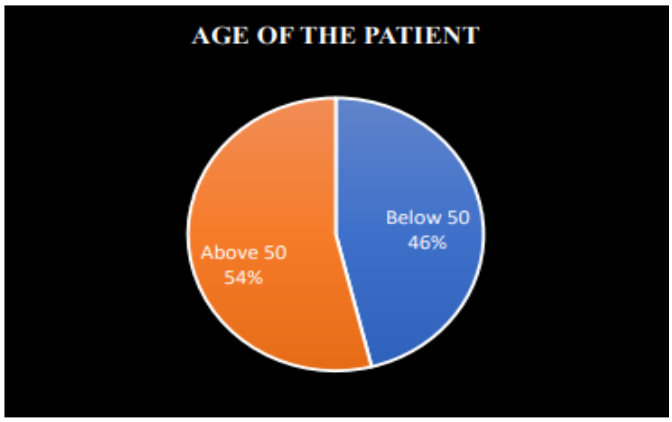


Figure 2: Distribution of study population based on age.

Parameter		Frequency	Percentage	p-value
Gender	Male	478	70	0.91
	Female	203	30	

Age	Below 50 years	314	46	0.95
	Above 50 years	367	54	

Table 1: Demographic Data.

Our results found that 2% of the patients had at least one of the oral manifestations after recovering from covid, whereas 98% of the patients did not have any persistent oral manifestation after covid-19 infection. The most prevalent symptom was altered taste sensation (6.31%), followed by toothache (3.37%), ulcer/any other painful lesion (1.61%), swelling/pain in gums (1.17%) and increase in tooth mobility (1.02%). While oral mucosal changes like dryness of mouth (0.58%) and burning sensation (0.73%) were less prevalent. (Fig 3)

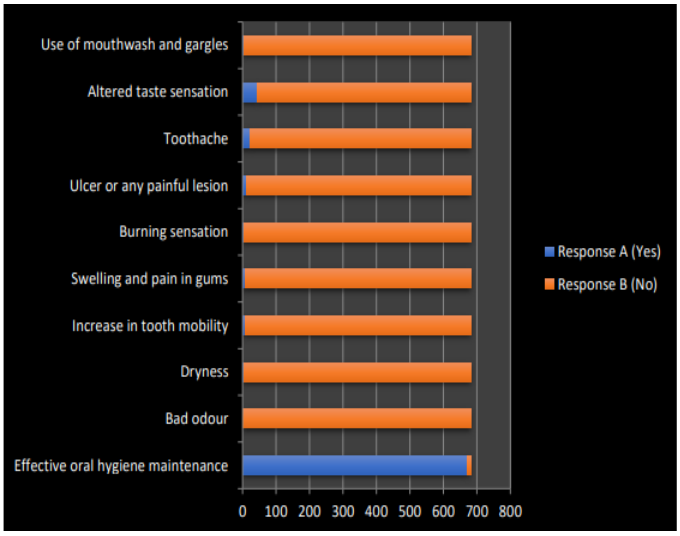


Figure 3: Prevalence of oral manifestations associated with recovered covid patients.

There was no significant association between incidence of most of the oral symptoms and demographic data. (Age, gender) ($p>0.05$, Table 2) However, significant difference was seen between incidence of ulcer and burning sensation with the gender. ($p< 0.05$, Table 2).

Table 2: Association between the occurrence of oral symptoms and status of different demographic aspects.

Symptoms	Parameter		Yes (n)	%	No (n)	%	P-value
Effective oral hygiene maintenance	Gender	Male	470	98.37	8	1.67	0.73
		Female	201	99.01	2	0.99	
	Age	Below 50 years	311	99.04	3	0.95	0.35
		Above 50 years	360	98.09	7	1.90	
Bad Odour	Gender	Male	3	0.62	475	99.3	1
		Female	1	0.49	202	99.5	
	Age	Below 50 years	1	0.3	313	99.68	1
		Above 50 years	2	0.54	365	99.45	
Dryness	Gender	Male	2	0.41	476	99.58	0.58
		Female	2	0.98	201	99.01	
	Age	Below 50 years	3	0.95	311	99.04	0.33
		Above 50 years	1	0.27	366	99.72	
Increase in tooth mobility	Gender	Male	4	0.83	474	99.16	0.43
		Female	3	1.47	200	98.52	
	Age	Below 50 years	1	0.31	313	99.68	0.13

		Above 50 years	6	1.63	361	98.36	
Swelling/ Pain in gums	Gender	Male	5	1.04	473	98.95	0.70
		Female	3	1.47	200	98.52	
	Age	Below 50 years	3	0.95	311	99.04	0.73
		Above 50 years	5	1.36	362	98.63	
Burning sensation	Gender	Male	1	0.2	477	99.79	0.02
		Female	4	1.97	199	98.02	
	Age	Below 50 years	3	0.95	311	99.04	0.66
		Above 50 years	2	0.54	365	99.45	
Ulcer or any painful lesion	Gender	Male	4	0.83	474	99.16	0.02
		Female	7	3.4	196	96.9	
	Age	Below 50 years	8	2.5	306	99.19	0.12
		Above 50 years	3	0.81	364	99.19	
Toothache	Gender	Male	16	3.3	462	96.7	1
		Female	7	3.4	196	96.6	
	Age	Below 50 years	8	2.5	306	97.5	0.29
		Above 50 years	15	4.09	352	95.91	
Altered taste sensation	Gender	Male	29	6	449	94	0.73
		Female	41	6.8	189	93.2	
	Age	Below 50 years	19	6	295	94	0.87
		Above 50 years	24	6.53	343	93.46	
Use of mouthwash/ gargles	Gender	Male	4	0.83	474	99.16	1
		Female	1	0.49	202	99.5	
	Age	Below 50 years	2	0.63	312	99.37	1
		Above 50 years	2	0.54	365	99.46	

Discussion

Post-Covid complications and associated health issues continue to trouble many, even days after recovering from covid. Besides the most prevalent post-covid complications such as fatigue, breathing difficulty and cough, dental issues are also being reported amongst many patients. However, to the best of our knowledge, no attempt has been made to review the available literature in this context. Therefore, this research is aimed to provide an overview of post COVID-19- oral manifestations.

The host receptor to which SARS COV-2 binds is the Angiotensin converting enzyme 2 (ACE-2).[8]

The expression of ACE-2 is noted in the oral mucosa which suggests the potential development of oral lesions. There are two mechanisms that may explain the development of such lesions: directly through the effects of the replicating virus, where these lesions will be

SARS-CoV-2-specific; and indirectly through COVID-19- associated physical and psychological stress or secondary to the drugs used for its treatment.[9]

In the present study loss of taste sensation (6.31 %) was the most common oral manifestations in recovered covid patients. Xu et al. reported the expression of angiotensin-converting enzyme 2 (ACE-2) in the oral mucosa, especially the dorsal tongue. ACE-2 is a host receptor to which SARS-CoV-2 binds.[4]

After entering the host, the virus gains entry into the host cells when protein S binds to specific receptors. The interaction between the S protein of SARS Cov-2 and ACE-2 leads to the recruitment of TMPRSS 2 which promotes the priming of protein S and facilitates the entry of the virus into the host cells. Another cell protein such as protease furin can also promote the entry of the virus into the host. After entry into the host cells, the viral genome is released and replication of the virus occurs.[10]

ACE2 protein was consistently expressed in the tongue epithelial layer of the taste buds. TMPRSS2 expression was strongly positive in taste bud cells, and furin-positive signals were detected in the lower layers of the taste buds explaining the possible taste disturbance in covid.[8]

Other commonly reported finding was ulcers (1.61%) in the oral cavity which can be contributed to the immune compromised state of the patient due to covid infection and various immune compressive medications used during the treatment of covid.

Some patients reported swelling and pain in the gums accompanied by increased tooth mobility directing towards an opportunistic fungal infection prevalent post covid.

This research summarized the oral manifestations of recovered COVID-19 patients, but large-scale observational studies are highly recommended to document the oral manifestations of recovered Covid patients. The other limitation was this was an online questionnaire; thus, we have not been able to document the patient's full history and a clinical oral examination, which might have a misleading impact on the results. Despite the limitations, this study's findings could help understand the oral manifestations associated with recovered COVID-19 patients.

Conclusion

The present study indicates some impact of covid-19 on oral cavity even after recovery from Covid-19 infection. Taste disorders which are highly prevalent in Covid seem to persist in some even after the course of the disease. Further studies with larger sample size and longer observation time are required to confirm our results and clarify the association of oral symptoms after recovering from covid.

References

1. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. JAMA. 2020.

2. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. J Autoimmun. 2020; 109:102433.

3. Sungnak W, Huang N, Becavin C et al. SARS-CoV-2 entry factors are highly expressed in nasal epithelial cells together with innate immune genes. Nat Med. 2020; 26:681-687.

4. Xu H, Zhong L, Deng J, et al. High expression of ACE-2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. Int J Oral Sci. 2020; 12:8.

5. Xu J, Li Y, Gan F, Du Y, Yao Y. Salivary glands: potential reservoirs for COVID-19 asymptomatic infection. J Dent Res. 2020; 99:989.

6. Zou X, Chen K, Zou J, Han P et al. Single-cell RNA- seq data analysis on the receptor ACE2 expression reveals the potential risk of different human organs vulnerable to 2019-nCoV infection. Front Med. 2020; 14:185-192.

7. Xu R, Cui B, Duan X, et al. Saliva: potential diagnostic value and transmission of 2019-nCoV. Int J Oral Sci. 2020; 12:11.

8. Sakaguchi W, Kubota N, Shimizu T, Saruta J, Fuchida S, Kawata A, Yamamoto Y, Sugimoto M, Yakeishi M, Tsukinoki K. Existence of SARS-CoV-2 Entry Molecules in the Oral Cavity. Int J Mol Sci. 2020 Aug 20;21(17):6000

9. Halboub E, Al-Maweri SA, Alanazi RH, Qaid NM, Abdulrab S. Orofacial manifestations of COVID-19: a brief review of the published literature. Braz Oral Res. 2020 Oct 30;34: e124.

10. Santoro A, Bientinesi E, Monti D. Immunosenescence and inflammaging in the aging process: age-related diseases or longevity? Ageing Res Rev. 2021 Nov; 71:101422.