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COVID-19 Vaccine Survey: Post Vaccine Complications Including Oral Manifestations

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BACKGROUND: The deadly pandemic began in November 2019 in Wuhan, Republic of China, has been a life altering event in the history of the Earth. Literature has suggested that a primary series plus booster doses of mRNA vaccine shows modest to high effectiveness against severe COVID-19 outcomes, including hospitalization, mechanical ventilation, and death also effectively prevents symptomatic infection.

AIM: To evaluate the post vaccination complications faced by people, with primary focus on oral manifestations after vaccination.

MATERIALS AND METHOD: The present study is a cross-sectional, questionnaire descriptive study, carried out from May 2021 to January 2022 to evaluate the public's knowledge, attitudes, and practices during the COVID-19 epidemic using an anonymous online questionnaire. The survey was conducted via an online platform.

RESULTS: Changes in sensitivity were reported by 2.7% and 3.1% of the sample after the first and second dose, respectively. Oral symptoms were reported by 3.1% and 4% of the respondents after the first and second dose. Among the oral manifestations, dry mouth was the most frequent OAE after both the first and second doses.

CONCLUSION: Based on the results of this preliminary survey, there is no observed significant correlation between vaccine administration for COVID-19 and facial and oral manifestation. Complications and vaccinations on apprehensions were significantly associated COVID-19 related psychological impacts that were studied.

KEYWORDS: Covid-19, Vaccine, Oral Manifestations

INTRODUCTION

The spread of coronavirus has been a life altering event in the history of the Earth. The deadly pandemic began in November 2019 in Wuhan, The Republic of China, and since then it has become a part of each and every country affecting international trade, travel and economy. The global death toll and severity of acute respiratory syndrome increased significantly as a result of its spread. This deadly virus resulted in infecting more than 645 million people with over 6.6 million deaths by December 2022 globally.¹ The world is observing an ever increasing number of infected cases with the transmission of the Omicron variant now. Although it is not the last variant as observed by and Covid adaptability would have to become a way of life. According to literature, the mRNA vaccine showed moderate to high efficacy in its primary doses against the severe COVID-19 outcomes.¹ However, substantial evidence of the harmful effects of these vaccines which have been introduced for the public health and safety are minimal.

Numerous studies in the past have demonstrated that the mRNA vaccine causes local exacerbations in the

form of swelling and erythema at the injection site rather than serious systemic adverse reactions.^{2,3} It was observed that females and young adults were noted to report more side effects than others.⁴ People all over the world have expressed their concerns and reluctance to get vaccinated, despite the data on COVID-19 vaccines. Additionally, studies have demonstrated that positive vaccination beliefs are associated with the intention to get vaccinated.⁵ Surveys indicate that people are concerned about the potential negative effects of the vaccine, which they believe would be more severe than the disease itself.^{6,7} Vaccine acceptance has been found to be subpar even among healthcare professionals, with concerns about the vaccine's safety, quality control, and potential side effects given its rapid development.^{8,9}

Vaccination clearly outweighs the risks posed by infections because it prevents 2 to 3 million to 6 deaths annually from infectious diseases. However, it is important that adverse effects should be recognized and treated in a timely manner to minimize the possible harm. Dentists and the medical community should be prepared to detect adverse drug reactions. There is very



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scarce evidence regarding the side effects of these vaccines and their booster regimens in the community. This study while giving a holistic understanding of COVID-19 focuses on the oral complications' post-vaccination. This study also aims to collect the data showcasing the potential oral side effects that are caused due to vaccination against Covid-19. This is being done in light of the fact that around 80% of the population has been successfully administered with two doses of the vaccine. This study further aims to spread awareness amongst people with respect to the side effects of vaccination with a view to reduce vaccine hesitancy.⁸

The rapid transfer of the other variants signifies that it is high time to get administered with the precaution dose as well. Therefore, we conducted this study in order to fully appreciate the oral side effects caused by the vaccine and associated precautionary dose. This is extremely important since the precautionary dose is meant to act as a third barrier against Covid infection. Vaccine hesitancy had been observed manifesting throughout the world in the fight against Covid.⁶

Therefore, there is a need to not only to educate people with correct facts related to Covid, vaccines, side effects, complications, precautionary dose and post-administration requirements, but there is also a need to develop faith as well as an understanding amongst the people with respect to vaccination and associated precautionary dose. This would go a long way in the fight against Covid and protect our future generations as well.

MATERIALS AND METHOD

The present study is a survey-form based cross-sectional study(KAP). The study was carried out from May 2021 to January 2022 during the COVID-19 epidemic using an online questionnaire. This questionnaire based survey was conducted through an online platform using Google forms. The participants were selected according to the following:

1. Age: ≥18 years,
2. Participant should be an Indian National
3. Participant should have internet access.

Ethical clearance was obtained from the independent ethical committee. Data of over 1000 participants was obtained through a questionnaire developed using Google Forms. Mazur et al., 2021 provided the research foundation for the questionnaire used in the study. The

questionnaire was mailed or sent via Whatsapp to the people with a request to fill the form. The form was designed in the English language. The purpose of the survey was explained in a message to all study participants.

The questionnaire consists of four sections (Appendix A):

1. Demographic Details
2. Medical History
3. Covid 19 Personal History
4. Vaccination status

Consent was taken from the participants before commencing the questionnaire. The first section is of professional and demographic data consisting of 4 questions which included their age, gender, e-mail and occupation.

The second part consists of 7 questions asking about their underlying medical conditions and lifestyle factors such as smoking or any other deleterious habit. The section on Covid 19 Personal history consists of 7 questions collecting data of their positive history, recovery set-up and general and major symptoms.

The last section consisted of 12 questions on Vaccination Status, number of dose, premedication or after medication and type of vaccine.

The oral manifestations evaluated in this study were: burning sensations of the mouth and mucosa, oral ulcer/aphthae-like lesion, pain, oral thrush, dysgeusia/taste alteration, dry mouth, tongue depapillation, angular cheilitis, respectively.

RESULTS

It was found that 59.4% of study participants who were infected with COVID-19 were females that was more than 40.5% of males. This distribution was statistically significant (P = 0.016) and is seen in table 1.

Infected with COVID-19				
	Yes	No	Total	p value
Males	135 (40.5)	320 (49.2)	455	P = 0.016*
Females	198 (59.4)	331 (50.8)	529	
Total	333	651	984	

Table 1. Distribution of study participants according to gender and COVID-19 infection. (Level of significance at p < 0.05; Statistically significant at *p < 0.05 using Chi-square test)

It was found that 9% among those who were infected with COVID-19 were smokers compared to 91% who were not smoking. In addition, 12.9% of study participants who did not have COVID-19 were smokers and 87.1% were non-smokers. This distribution was not statistically significant ($p=0.07$) and is depicted in table 2.

Infected with COVID-19				
Smoking	Yes	No	Total	P value
Yes	30 (9)	84 (12.9)	114	$P = 0.07$
No	303 (91)	567 (87.1)	870	NS
Total	333	651	984	

Table 2. Distribution of study participants according to smoking status and COVID-19 infection. (Level of significance at $p < 0.05$; NS: Not significant using Chi-square test)

Oral symptoms were reported by 3.1% and 4% of the respondents after the first and second dose, respectively. Among the oral manifestations, dry mouth was the most frequent OAE after both the first and second doses, at 1.2% and 0.36%, respectively. Oral aphthous-like lesions were reported by 0.36% after the second dose, respectively. Burning sensation was more frequent than alteration in taste at 0.7%. (Figure 1)

The symptoms lasted for almost 4 days to a week after the second dose in the majority of the population. (Figure 2)

DISCUSSION

The current survey-based study aimed to assess the facial and oral manifestations after administration of a COVID-19 vaccine.

The study results showed very few occurrences of such symptoms (40 out of 1100, 3.63%, after the first dose; and 22 out of 1100 2%, after the second dose) and the vast majority of respondents (70.9%) received the COVISHIELD™ vaccine. The study participants were mostly female (53.7%), with 46.2% males. 20.5% of people suffered from medical conditions, 11.6% were smokers, 7.5% had allergies, and 75 had a regular medication intake. The survey was conducted from May 21 to January 22 to allow for the enrolment of maximum number subjects with a median follow-up time of 2 months after the second dose.

As described previously by Tarakji et al., who discussed vaccination against the hepatitis B virus (HBV), most of the oral complications are self-limiting.³ Furthermore, oral side effects following the administration of other vaccines (i.e., polio or diphtheria), are reported by Riad were very rare.¹⁰ Research studies about the possible oral manifestations of all types of vaccinations represent only a small portion of total vaccine research and are mostly in the form of case reports.^{4,5}

The COVID-19 vaccination process might be one of the first seen in the 21st century that has spread worldwide in a short time interval, and on a scale that involves almost all ethnic, geographical and age groups. Such a

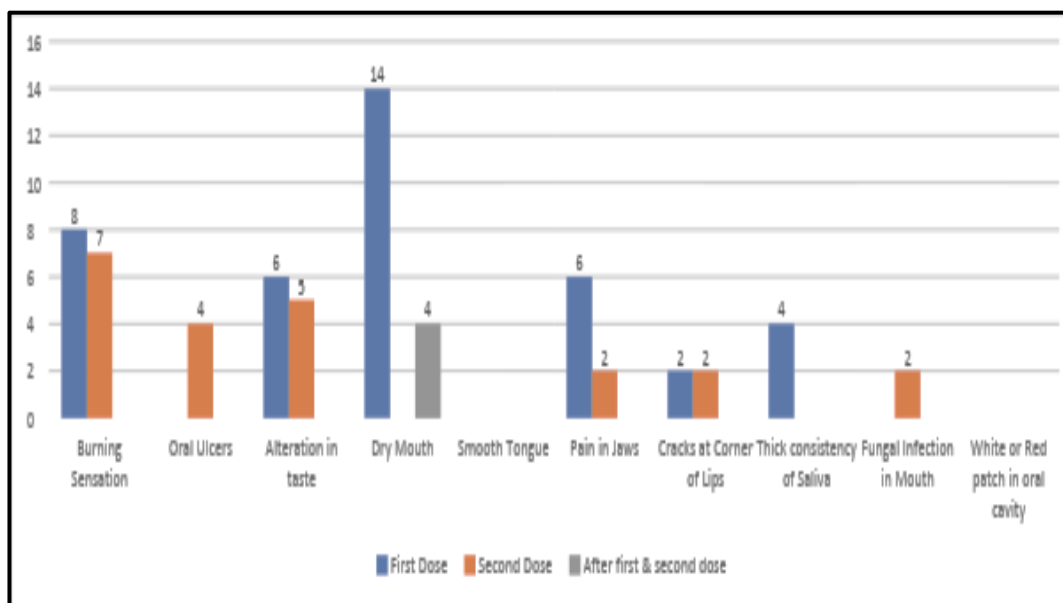


Figure 1. Oral Manifestation among study participants post Covid vaccination

scenario presents a greater possibility of observing the incidence of oral manifestations, which with the normal seasonal vaccinations might have gone unseen or considered as coincidence.¹¹

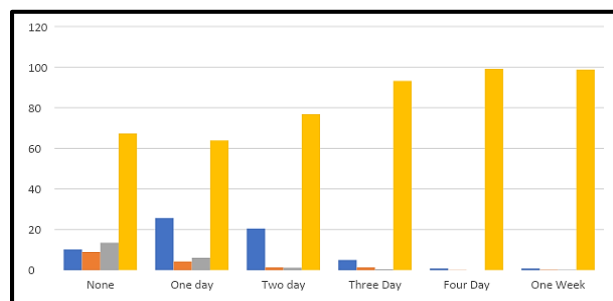


Figure 2. Duration of symptoms among study participants post Covid vaccination

In the current survey, almost all of the participants (97.3%) received the Covishield vaccine. ChAdOx1 nCoV-19 CoronaVirus Vaccine (Recombinant) 5×10^{10} virus particles (vp). It is a recombinant, replication-deficient chimpanzee adenovirus vector encoding the SARS-CoV-2 Spike (S) glycoprotein. Produced in genetically modified human embryonic kidney (HEK) 293 cells. This product contains genetically modified organisms (GMOs). Both COVISHIELD™ (manufactured by Serum Institute of India Pvt Ltd) and COVID-19 Vaccine AstraZeneca (manufactured by AstraZeneca) are ChAdOx1 nCoV-19 Corona Virus Vaccines (Recombinant).⁷

In a national cross-sectional study in the UK, Menni et al., 2021 found that the ≤ 55 -years-old individuals had significantly higher levels of side effects prevalence, including injection site pain, headache, and fatigue, compared to the >55 -years-old individuals. This trend was found in both the mRNA-based (BNT162b2) and the viral vector-based vaccine (ChAdOx1 nCoV-19).⁸

Oral paraesthesia (1.3%) and oral ulcers (1.1%) were rarely reported by our participants, thus indicating that oral side effects among young adults might have a low prevalence. While the COVID-19 infection-related oral manifestations were reported by young adults as well as middle-aged and senior adults, all the reported cases of oral side effects following BNT162b2 and ChAdOx1 nCoV-19 vaccines belonged to middle-aged adults. Skin rash (0.4%) and skin eruptions (0.4%) were also reported rarely by our participants and evidence on the predicted prevalence of the rare orofacial and skin-related side effects is still lacking.⁸

The survey questions about oral symptoms, facial paresis, facial aesthetics and paralysis. The queries about oral symptoms investigated burning sensations, oral aphthous-like lesions, taste alteration, xerostomia, tongue depapillation, pain, stomatitis/mucositis, commissural cheilitis and oral candidiasis. Changes in sensitivity were reported by 2.7% and 3.1% of the sample after the first and second dose, respectively. Oral symptoms were reported by 3.1% and 4% of the respondents after the first and second dose, respectively. Among the oral manifestations, dry mouth was the most frequent OAE after both the first and second doses, at 1.2% and 0.36%, respectively. Oral aphthous-like lesions were reported by 0.36% after the second dose, respectively. Burning sensation was more frequent than alteration in taste at 0.7%.

The current study evaluated the duration of symptoms generally and did not separately assess the duration of oral and facial symptoms; however, the low incidence of such symptoms justified the survey strategy. Moreover, the questionnaire investigated possible taste alterations after COVID-19 vaccination, an issue raised before with regard to influenza vaccination.¹² Only 0.5% reported taste alteration. However, the questionnaire was not led by chemosensory testing to confirm whether these factors were directly related to the vaccination, general disease, drug intake, presence/absence of allergies, diabetes and autoimmune pathologies, or other factors such as the severity of the general adverse reactions after vaccination.

The struggle to provide the COVID-19 vaccine is significant in most countries. And keeping in consideration the hike in the number of COVID cases in the last few months along with the present situation in china, it is very important to educate the people about the need of vaccination and to take out the fear of side-effects from their minds.

CONCLUSION

Based on the results of this preliminary survey, there is no observed significant correlation between vaccine administration for COVID-19 and facial and oral manifestation.

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