Archives of Dental Research 2021;11(2):96–98

Content available at: https://www.ipinnovative.com/open-access-journals

Archives of Dental Research

Journal homepage: https://www.adr.org.in/

Review Article

Knowledge, attitude and practice of infection control from aerosol generating procedure in clinical setting among dentist during COVID-19 pandemic: A multi centric survey

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ARTICLE INFO

Article history:
Received 20-10-2021
Accepted 08-11-2021
Available online 31-12-2021

Keywords:
COVID19
Dentist
Crossinfection control
Knowledge
Pandemic
SARSCoV2

ABSTRACT

Dentistry is the profession in which there is a high risk of contagion due to the exposure to aerosol/droplets, saliva and blood which is produce during the majority of dental procedures. SARS-CoV-2 therefore can be transmitted from an infected individuals through inhalation of aerosol/droplets or by direct contact with mucous membrane, oral fluids, contaminated instruments and surfaces. The present study was proposed to assess the level of awareness, perception, and attitude regarding COVID-19 and infection control among dentists. It was concluded that the dentists involved in the current survey showed satisfactory knowledge and a positive attitude towards COVID-19 during the outbreak.

1. Introduction

The newly discovered coronavirus disease or COVID-19 is a viral infection which was started in Wuhan, China and in the rest of the world it caused the outburst of pneumonia. This rapidly spreading virus is more infectious as compared to severe acute respiratory syndrome coronavirus and Middle East respiratory syndrome coronavirus.[1] Transmission of this disease from an infected person can be through touching or coming in contact with them, by airborne droplets, or by contaminated surfaces. Its transmission through blood or saliva have not been discovered yet but it may be possible because of the known transmission of blood-borne infectious diseases like hepatitis B and hepatitis C virus and HIV/AIDS through blood or saliva. Transmission of disease by these routs increases the concern about a similar route of transmission for COVID-19 in the dental practice.[2]

According to the information given by medical staff, many of them have acquired the disease while working with an infected individuals.[3] As dental professionals has to work in close contact with patients due to the nature of the dental treatment, transmitting and acquiring the infection between staff or individuals in dental clinics can be more, in fact it could be a more unsafe environment.[2]

Dental practitioners are at higher risk of infection as they have to deal with aerosol/droplet, saliva and blood which is produce during many of the dental procedures.[4–7] Transmission of SARS-CoV-2 can be through inhalation of aerosol/droplets or by direct contact with mucous membranes, oral fluids, contaminated instruments and surfaces from an infected individuals during the dental procedures.[8–10] For prevention from such diseases it is important to increase the level of awareness among dental practitioners and to implement a good preventive measures in dental clinics. Keeping the aforementioned views in mind the present study was proposed to assess the level

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https://doi.org/10.18231/j.adr.2021.015

of awareness, attitude and perception in infection control regarding COVID-19 pandemic among dentists. Present study included 1000 Dentist practicing all over the India. Data were collected by self-administered questionnaires that composed of 7 questions. The questionnaire consisted of questions assessing their level of awareness, signs and symptoms, mode of transmission, contamination and infection control for preventing COVID -19.

2. Materials and Methods

A multi-centric cross-sectional survey-based study was conducted from March 2020 to August 2020 during a period of strict lockdown to implement social distancing in order to avoid the spread of COVID-19. As it was not feasible to conduct a population-based survey at this time, the investigators used an online method of data collection. Our study population consisted of dentists who work all over India, regardless of their place of work, in private clinics, hospitals, or health centers.

A questionnaire was designed on google forms, available at: https://docs.google.com/forms/d/e/1FAIpQLSe2lAYyVcUvN4yxe_zXtfiJ0EQiNiE49WnrJYBKdI3gcGpOg/viewform?usp=sf_linkand this hyperlink was shared via WhatsApp groups of Dentist all over the India. The hyperlink was additionally shared personally to Dentist in the contact lists of the investigators. Upon clicking on the link, the 1st page assured the data confidentiality. The Dentist were informed about the study objectives and stated that this study was purely voluntary participation. They had to click on the 'next' button to answer the questionnaire, and had whole freedom either to answer or decline the questionnaire. Only the principal investigator had access to the data and no personal details (e-mail ID, telephone number etc.) have been required. Responses were sought only from the Dentists who were currently practicing in India and a submission was considered only when the 'submit' button was clicked at the end of the questionnaire. The study duration was from March 2020 to August 2020.

The questionnaire involved the questions which assess the level of knowledge, attitude, practice, demographics, information sources, and infection control towards COVID-19.

3. Result

In this study, 100% of the Dentist stated that the COVID-19 Pandemic has affected their practice. 100% Dentist were aware of infection control protocol given by Government on COVID 19 pandemic. 66 % Dentist stated that the estimated time for the virus to last anywhere after use of aerosol generating procedures is 1-2 hours whereas 34 % stated that it is 35 min to 1 hour. 75% of Dentist prefers preprocedural oral mouth rinse recommended by CDC during COVID 19 pandemic to reduce viral load before commencement of any treatment whereas 25% didn't prefer the same. 87.5% of Dentist were aware of extra oral suction devices to prevent dispersion of droplets and aerosols whereas 12.5% were not aware of the same. According to OSHA Guidelines, 75% of Dentist stated that Aerosol Generating Procedures falls into very high risk whereas 25 % stated that it falls into high risk. 62.5% Dentist have arranged different room in clinics where aerosol producing treatment procedures to be carried out whereas 37.5% were not aware of such arrangement.

4. Discussion

This survey enlightens the level of awareness, perception, and attitude of dentists in controlling infection especially in the COVID-19 pandemic. The present approach is for controlling the source, provide early diagnosis, isolation, supportive care for affected patients and lower the risk of transmission by using infection prevention and control measures against COVID-19. The responses given by the participants reflects their knowledge of Government guidelines for infection control in COVID-19.[5]

Dentists working in aerosol generated environment, their assistants, other office staff members as well as patients are at an extremely dangerous risk of inoculation of virus. Most riskier factor is the transmission of splatter and droplet to the midface of the dentist and assistant and the nasal area of the patient.[1] In the present study 66 % of Dentist stated that the estimated time for the virus to last anywhere after use of aerosol generating procedures is 1-2 hours whereas 34 % stated that it is 35 min to 1 hour. Miller 1995 stated that the transmission of 100,000 microbes per cubic foot with aerosolization of up to six feet can takes place by an ultrasonic instrumentation and if in that area ventilation is not proper, microbes can survive from 35 minutes to 17 hours.

A report called "Guidance on Preparing Workplaces for COVID-19" was released by Occupational Safety and Health Act (OSHA). According to OSHA occupational risk is categorized as very high, high, medium, and lower risk and the occupations in which aerosol is generated comes under the category of very high risk,. The present study showed that 65 % of the dentists have awareness and knowledge about the OSHA guidelines. The use of preprocedural mouth rinse has been proposed to reduce the viral load in saliva and oropharyngeal tissues, thus decreasing viral load in dental aerosol.[5] 75% of the participants preferred the use of preprocedural mouth rinse.

"Implement Workplace Controls, Engineering Controls" recommended that the dental practices should install negative-pressure rooms or airborne infection isolation rooms for operatories in which procedures involving aerosol will be performed.[1] About 62.5% of Dentist were aware of arranging different room in clinic where aerosol producing treatment procedures to be carried out whereas 37.5% were not aware of such arrangement.

Table 1: Responses to various questions in relation to various practices among the study population.

Question	Option					P value	Chi Square test
1. Do you think this pandemic affected your academics and practice-	Yes		No				
	1000 (100%)		0 (0%)			0.001	
2. Are you aware of infection control protocol given by Government on COVID 19 pandemic	Yes 1000 (100%)		No 0 (0%)			0.001	
3. What is the estimated time for the virus to last anywhere after use of aerosol generating procedures	1-2 hours	35 min-1 hour	Other				
	660 (66%)	340 (34%)	0 (0%)			0.02	
4. Do you prefer preprocedural oral mouth rinse recommended by CDC during pandemic COVID 19 to reduce viral load before commencement of any treatment.	Yes	No	I don't know about these guidelines	Other			
	750 (75%)	250 (25%)	0 (0%)	0 (0%)		0.001	
5. Are you aware of extra oral suction devices to prevent dispersion of droplets and aerosols	Yes		No				
	850.5 (87.5%)		140.5 (12.5)			0.004	
6. According to OSHA Guidelines Aerosol Generating Procedures falls into which category	Very high risk	High risk	Medium Risk	Low risk	Other		
	750 (75%)	250 (25%)	0 (0%)	0 (0%)	0 (0%)	0.002	
7. Are you aware of arranging different room in clinic where aerosol producing treatment procedures to be carried out.	Yes	No	Other				
	620.5 (62.5%)	379.5 (37.5%)	0 (0%)			0.0012	

5. Conclusion

The present study concluded that the dentists involved in the survey showed satisfactory knowledge and a positive attitude towards COVID-19 during the outbreak. However, there is still scope for recommendations to improve the knowledge level amongst dentist.

6. Source of Funding

None.

7. Conflict of Interest

None.

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Cite this article: Fatema M, Puri S, Shewale A, Bele R, Wargantiwar A. Knowledge, attitude and practice of infection control from aerosol generating procedure in clinical setting among dentist during COVID-19 pandemic: A multi centric survey. *Arch Dent Res* 2021;11(2):96-98.