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Awareness And Practice Of Infection Control Protocol Amidst Covid-19 Pandemic In Private Dental Clinics In North India: An Original Research

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ABSTRACT:Aim: The purpose of our research was to assess the knowledge and awareness regarding infection control practice against coronavirus infection in various dental clinics in North India.
Methodology: A descriptive survey was conducted amongst 200 dentists. A questionnaire consisting of 11 questions was distributed, based upon knowledge of COVID-19, transmission as well as prevention strategies that can be implemented in dental clinics for stopping the chain of outbreak of this pandemic. The data was analysed with the help of descriptive statistics.
Results: 71% of study participants felt the need for using N-95 masks routinely during patient treatment. An astounding number of participants (92%), believed that there have been significant changes in infection control after COVID-19 pandemic. 65% of participants believed that HVE suction devices as well as HEPA filters need to be used to control aerosol spread so as to prevent COVID-19 infection.
Conclusion: Dentists in North India showed satisfactory knowledge and positive attitude towards COVID-19. Improving dentists' level of knowledge could be achieved through increasing their accessibility to materials provided by dental health care authorities, which specifies the best and safest approaches for dealing with patients during and after the outbreak.

Keywords COVID-19, SARS- CoV-2, Pandemic, Respiratory infection.

1. INTRODUCTION

The World Health Organization (WHO) had declared the novel coronavirus (COVID-19) a pandemic on the 11th of March 2020.[1] The strain that the pandemic has placed on the healthcare facilities across the world is unprecedented and extraordinary measures are adopted to meet the challenges.[2] Hospitals have made the use of masks, gloves, and gowns mandatory for all staff who attend to patients or interact with each other; quarantined thousands of people and recommended that healthcare workers (HCW) not to have any contact outside work duties.[3,4] There are hospitals with a persistent shortage of ICU beds, ventilators, personal protective equipment (PPE), and other medical equipment. These increase the risk of exposure among the HCW when attending to COVID-19 infected patients and generates fear and stress of contracting the virus.[6] Coronaviruses are a distinct group of viruses which can cause diseases of varying degree of severity. Corona viruses first became evident as Severe Acute Respiratory Syndrome in China followed by Middle East Respiratory Syndrome (MERS) in North India & Middle East. Evidence from previous research suggests that both SARS coronavirus (SARS-CoV) and MERS coronavirus (MERS-CoV) originated from bats and infected humans using intermediate host such as civets in case of SARS-CoV and camels in case of MERS-CoV. The chain of transmission for Human SARS-CoV was broken with isolation of probable cases and closing wet markets where it originated via direct contact with civets. Scientific studies have shown that there are two main routes of transmission of Covid-19 i.e. direct (person-to- person touch or inhalation of short-range respiratory droplets) and indirect (airborne and fomite mediated).[7] The most commonly cited clinical symptoms of Covid-19 are raised body temperature, dry cough, malaise, and dyspnoea.[8] The consequences are far-reaching and unpredictable, particularly for the dental community and for patients seeking dental care. Results from a recent study showed that aerosols containing SARS-CoV-2 remain infectious for up to 3 hours in confined spaces, 4 hours on copper, 24 hours on cardboard, and up to 3 days on stainless steel and plastic. Since use of ultrasonic scaler, triple syringe, dental hand piece, and other high-speed driven instruments during dental treatment can generate tremendous amount of aerosols, putting dental practitioner's dental surgery assistants and their patients at high risk for contracting Covid-19. There have been many recommendations in the United States and elsewhere to cease non-essential dental procedures and restrict treatment to emergency care.[9]

2. AIM OF THE STUDY

The purpose of our research was to assess the knowledge and awareness regarding infection control practice against coronavirus infection in various dental clinics in North India. It also assessed the amount of knowledge about COVID infection and its prevention strategies.

3. METHODOLOGY

A descriptive survey was conducted amongst 200 dentists, of which 25 were female and rest were male dental surgeons; practicing in various dental clinics across North India. The sample size was obtained using a random sampling technique. A questionnaire consisting of 12 questions was distributed, based upon knowledge of COVID-19, transmission as well as prevention strategies that can be implemented in dental clinics for stopping the chain of outbreak of this pandemic. (Table 1) Google form containing the questions were emailed to the participants and the reply was recorded in Microsoft Excel sheet. Participation was voluntary and the information provided by the participants was treated confidentially. The

data were analysed using IBM Statistical Package for the Social Sciences (SPSS) version 25 (IBM Corporation, New York, NY, USA). Descriptive statistics were obtained with the help of frequency percentage.

4. RESULTS

In our study, around 67% of participants were aware about the latest developments about COVID-19 pandemic. 71% of study participants felt the need for using N-95 masks routinely during patient treatment. An astounding number of participants (92%), believed that there have been significant changes in infection control after COVID-19 pandemic. 88% of participants believed that it is important to educate the people more about this disease, transmission as well as prevention. However, only 54% participants observed stringent precautions of social distancing in the waiting area of clinic. Unfortunately, only 43% of participants were practicing proper disinfection of items between successive patients. 65% of participants believed that HVE suction devices need to be used to control aerosol spread. (Table 2)

Table 1- Questionnaire of the present study

Q. No.	QUESTIONS
1	Are You Updated with the latest news about the spread of the COVID-19 Pandemic?
2	Are You Updated with the latest health online resources for COVID-19?
3	Before the COVID 19 Pandemic, Did You Routinely Follow Universal Precautions of Infection Control for Every Patient?
4	Before the COVID 19 Pandemic, were you familiar with the "Transmission-Based Precautions" for dental procedures?
5	Do you think N-95 mask should be routinely worn in dental practice as a new precaution?
6	Did your infection control routine change after the COVID 19 Pandemic?
7	Is social distancing practiced in the waiting area?
8	Disinfecting items between patients is followed?
9	Sterilize (or autoclave) items before being used with patient is followed?
10	Is it important to educate people about COVID-19 do prevent the spread of the disease?
11	Do you know who to contact in case of unprotected exposure to a known or suspected COVID-19 patient?
12	Do you use of HVE suction devices and HEPA filters to control spread of aerosols?

Table 2- Data recorded in the study

Question No.	Variable in the study	Measured data
1	Updated about latest developments related to COVID-19	Yes (67%)/ No (33%)
2	Knowledge about online health sources in relation to COVID-19	Yes (89%)/ No (11%)
3	Universal precautions for infection control	Yes (62%)/ No (38%)
4	Transmission based precautions	Yes (45%)/ No (55%)

5	N-95 masks recommendation for routine usage in clinics	Yes (71%)/ No (21%)
6	Change of infection control routine after pandemic	Yes (92%)/ No (8%)
7	Social distancing in waiting area	Yes (54%)/ No (46%)
8	Disinfecting items between patient treatments	Yes (43%)/ No (57%)
9	Sterilization of items before starting of any treatment	Yes (93%)/ No (7%)
10	Important to educate people about COVID-19	Yes (88%)/ No (12%)
11	Knowledge about helpline in relation to COVID-19	Yes (61%)/ No (39%)
12	Usage of HVE suction and HEPA filters for controlling aerosol spread	Yes (65%)/ No (35%)

5. DISCUSSION

The uncertainty and chaos caused by the covid-19 pandemic raises many concerns for dental profession regarding practice safety and evidence-based guidelines. A wide array of recommendations available through scientific publications related to covid-19 and dental practice management, makes the task of presenting the most relevant and up to date literature more important than ever. To achieve optimal infection control, a better understanding of the chain of infection is crucial for the control and prevention of any infectious disease. The chain of infection requires a pathogen (virus or bacteria), natural reservoir (human or animal) to reside and multiply, which then leaves host through portal of exit, and enters into a susceptible host through portal of entry using some mode of transmission. Interrupting chain of infection anywhere along the chain will stop the spread of infection. The standard infection control provisions in dentistry can potentially serve as first line of defence for many dental professionals. However, considering highly contagious nature of SARS-Cov-2, extra protective measures should be adopted to prevent the transmission of Covid-19 disease. We have identified 4 crucial phases which can be adopted to break the chain of transmission: (i) protocols for patient triage before treatment, (ii) patient evaluation upon arrival, (iii) during treatment, and (iv) after treatment.[10] Ge Z et al suggested posting cough etiquette instructions at entrances and waiting area to promote respiratory hygiene. When preparing patient for the treatment, it has been suggested that preprocedural mouth rinse with an oxidizing agent such as 1% hydrogen peroxide or 0.2% povidone iodine for 1 minute should reduce the viral load in aerosols. Several studies reported that a common preprocedural mouth rinse, chlorhexidine may not be effective against Sars-Cov-2, because there is lack of evidence or systemic data and virus is susceptible to oxidation. In addition, use of rubber dam and high-volume evacuation/suction (HVE) during aerosol generating restorative procedures can reduce airborne and surface contamination.[11] Use of less expensive high-volume evacuator (HVE) or expensive high efficiency particulate arrestor (HEPA) filters, if held within 6 -15 mm of aerosol generating tip can clean up to 90% and 99.99% contaminated air, respectively.[12] A rubber dam should be used where possible, which can potentially eliminate all sources of aerosol contamination from blood or saliva by blocking the throat and soft tissue area, except the tooth/teeth undergoing treatment.[13] An in-vitro trial conducted by Samaranayake et al found 70% reduction in aerosol with use of rubber dam during conservative pedodontic procedures.[14] Peng et al recommends use of Carisolv, a minimally invasive chemo-mechanical removal of carious dentine and hand scaler for periodontal procedures where

rubber dam is not feasible. Finally, the effectiveness of rubber dam as an isolation barrier is merely dependent on the placement skills of the provider and its' technique sensitivity.[15] Peng et al emphasized use of dental hand piece with anti-retraction/anti-reflux valve to prevent aspiration of contaminated bodily fluids into the tubes of hand-piece or dental unit and subsequent cross-infection. Although there is limited evidence on effectiveness of anti-retraction valve for eliminating risk of cross-infection, its use has been suggested as an additional preventive measure to reduce cross-contamination.[16] In our study we observed that, most of the dental surgeons were equipped with basic knowledge about COVID-19 pandemic, its transmission as well as prevention strategies. They were also aware about HVE suction devices as well as HEPA filters which help to control aerosol splatter, which is the prominent mode for spread of COVID- 19 infection. An interesting feature observed that infection control changed and became more stringent with the usage of N-95 masks and PPE gowns. They also believed that people need to be educated more about prevention against this pandemic till an effective vaccine is made available.

6. CONCLUSION

In general, dentists in North India involved in the current 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 dental staff. In addition, it is recommended to increase the dentists' access to materials provided by dental health care authorities and to specify the best and safest approaches when dealing with COVID-19 patients during and after the outbreak.

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