

Evaluation of Dentist's Awareness About Less Aerosol Producing Procedures During Covid 19 Pandemic

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Abstract

Aim: The aim of present study is to evaluate Dentist's awareness about less aerosol practice during Covid 19 pandemic.

Materials and Methods: The study involved 600 dentists from all over India. A self-reported online questionnaire was developed to evaluate dentist's awareness about less aerosol producing procedures. The collected data was tabulated for statistical analysis. The distribution of responses is presented with frequency and percentage.

Results: The results showed that most of the dentists are aware and are practicing less aerosol producing procedures.

Conclusion: Most of the respondents recommend these less aerosol producing procedures should be continued in this pandemic scenario

Introduction

The Covid -19 pandemic has brought many unprecedented challenges in the professional lives of all health care professionals [1]. According to Occupational Safety and Health Administration (OSHA), dental health care personnel (DHCP) are placed in very high exposure risk category as dentists work in close proximity to the patient's oral cavity. Also, dental procedures involve the use of rotary instruments such as handpieces and scalers, which generate aerosols [2]. The size of the dental aerosol particles is less than 50 μm . The smaller particles of an aerosol (0.5 to 10 μm in diameter) have the potential to penetrate and lodge in the smaller passages of the lungs and are thought to carry infectious organism. The problem raised with respect to COVID-19, is related to the easy spread of viral agents in the air during dental procedures. Airborne transmission of SARS-CoV-2 can occur during medical procedures that generate aerosols ("aerosol generating procedures"). Hence, aerosol is the most aggressive source of COVID-19 as well as other viral infections, placing dentists and their collaborators at the first line of the exposure. New approaches such as Tele dentistry, less aerosol producing procedures such as nonrestorative cavity control, atraumatic restorative treatment, chemo mechanical caries removal will help dentists to assist patients without adding the risk of cross infection. Studies assessing the awareness of these procedures in the context of Covid 19 not have been conducted in our country. In this regard this study aims to evaluate Dentist's awareness about less aerosol producing procedures.

Materials and Methods

The present study was conducted in Department of Pediatric and Preventive Dentistry, Malabar Dental College and Research Centre, Manoor. This prospective, cross-sectional study was carried out. A semi -structured questionnaire written in English was pretested for validity and revised according to feedback from research experts. The study was conducted among dentists in India, including those doing post-graduation studies, general and specialist dentists working in government, private and other health sectors. Questionnaire was made available using Google forms and the link was circulated among the Dentists. Sample size required for the study was calculated using Cochran's sample size as 600. The questionnaire consisted of five questions regarding their demographic data and 24 questions related to their awareness about less aerosol producing procedures. The collected data was tabulated in Microsoft excel and descriptive statistics were performed. The distribution of responses is presented with frequency and percentage. A total of 612 respondents were included for the statistical analysis.

Results

Of the 612 respondents, the majority of the respondents, 75.6% (462) had an age range of 25-35 years. While considering the duration of practice, 42.4% (259) had an experience of above 15 years and 48.7% (298) for 5-15 years. Of them 53.5 % (327) were working for 6-8 hours /day whereas 25.8%(157) for 2-4

hours/day. Frequency distribution of overall responses to closed end questions are presented in Table 1. Everyday practices among dentists are depicted in Figure 1. Out of total respondents 46.1% (282) are from multichain setting 29.9% (182) are hospital based and 24 [1] from single chair setting. The triage process in a dental office begins when a patient calls with a dental emergency. The goal should be to learn and record adequate information so that the appointment coordinator knows where best to schedule the patient, and the dentist and clinical staff know what to expect when the patient arrives. Results regarding the practice of dentists to screen the patient are presented in Figure 2. The various preventive measures taken by the dentist to reduce aerosol contamination is depicted in Figure 3. From the respondents who are using PPE, 52.8% (323) are using its full components, whereas 25.1% (153) relay only on face mask, respirator, gloves and face shield. In the current study 49.1% (300) of the respondents are doing aerosol generating procedures daily, whereas 31% (189) are doing only for emergency. While assessing knowledge and practice of less aerosol generating practice of dentist, it was seen that 69.7% were doing with fluoride varnish to manage incipient lesion followed by CPP-ACP agents (28.8%), antimicrobial agents (18.8%) and resin infiltration (11.4%). The various preventive methods implemented by the respondents are presented in Figure 4.

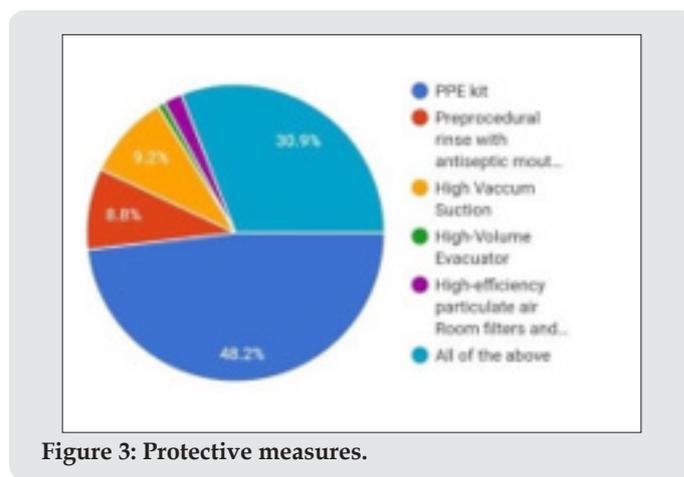


Figure 3: Protective measures.

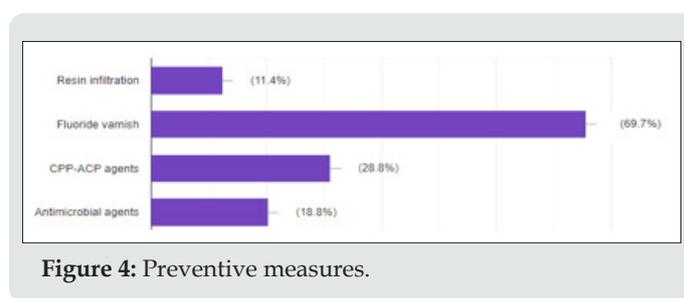


Figure 4: Preventive measures.

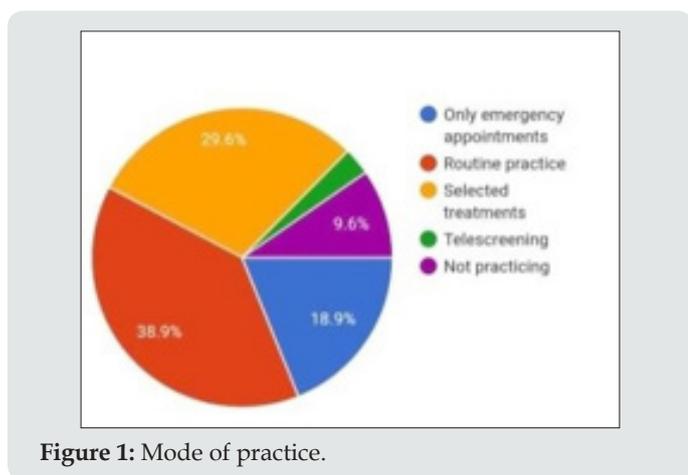


Figure 1: Mode of practice.

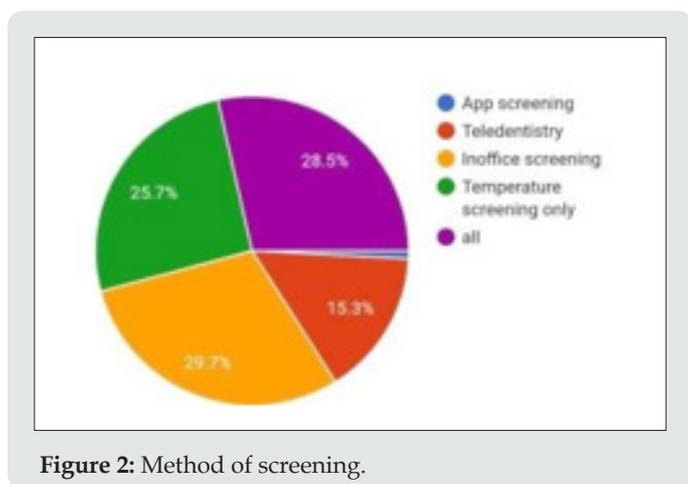


Figure 2: Method of screening.

Table 1: Results of closed end questions.

SI no	Question	%	
		Yes	No
1	Have you made arrangements for proper ventilation?	91.50%	8.50%
2	Are you using rubber dam isolation for endodontic/rotary procedures?	62.60%	37.40%
3	Are you using ante retraction handpiece during covid 19 pandemic?	83.70%	16.30%
4	Are you practicing atraumatic restorative treatment [ART] during covid 19 scenario?	68.90%	31.10%
5	Do you think ART is an effective treatment option during COVID 19 outbreak?	87.50%	13%
6	Are you practicing Interim Therapeutic Restoration during COVID 19 pandemic?	51.30%	48.70%
7	Are you using chemo mechanical caries removal technique during COVID 19 pandemic?	41.50%	48.70%
8	Do you think dental sealants should be indicated as routine procedure in a post COVID Scenario	81.50%	18.50%
9	Do you practice Nonrestorative cavity control [NRCC] during COVID 19 pandemic?	66.30%	33.70%
10	Do you think these aerosol reducing measures should be used routinely in post COVID scenario	92.60%	7.40%

Discussion

Dentists, being in close contact with the patient's droplets and aerosols generated, have to revise the operating protocols to protect the team and the patients from the risk of infectious diseases. For many, the dental practice is a source of possible infections, considering that the first person at risk is the dentist himself. In the present study, it was found that only 29.9% (182) are doing only aerosol generating procedures which is in accordance with CDC guidelines which states that non-emergency dental procedures should be postponed³ which is lesser than the study conducted by Pandey et al. (60%) [4] and Duruk G (49.95%) [5] of the respondents were practicing aerosol generating procedures. Aerosol generating procedures increases the viral load in the dental operatory many folds; hence, they should be avoided or minimized to reduce the chances of spreading COVID-19. Infected droplets suspend in the air for hours. Therefore, attention to proper ventilation during and after treatment is very important. In the current study, 4.2 % of the respondents are using high efficiency particulate air [HEPA] filters to reduce contamination which is much greater than study by Pandey .N, were none of the respondents were using HEPA filter [4]. Isolating the oral cavity with the use of rubber dams greatly reduces the spread of respiratory droplets and aerosols containing saliva or blood coming from the patient and aimed to the operator area of action. In present study, it was found that 62.6% of the respondents were using rubber dam for aerosol generating procedures which is lesser than the study by Gómez- Clavel et al. in which 84.1% respondents were using rubber-dam isolation [6].

WHO advocates the use of anti-retraction handpieces designed with anti-retractive valves during this Covid times as they prevent the diffusion and dispersion of droplets and aerosol. In the current study, 83.7% of the respondents were using anti retraction hand piece in their practice. The dental treatment should be as minimally invasive as possible. Clinical dental practice has to be reorganized and conventional clinical approach needs to be modified and replaced with more prevention-based, non-invasive, minimal intervention approach like nonrestorative cavity control, chemo mechanical caries removal, atraumatic restorative treatment, fluoride application, sealant placement etc. NRCC is a 3-part treatment option for dentine cavities in the primary dentition, for root carious lesions and cavitated coronal smooth surface lesions. The first part is that the patient's oral hygiene procedure/ habits improve and involve the exposed dentine. For this, it may be necessary to expose the cavity (second part) so that it is accessible for the toothbrush (the lesion exposure method). As long as the dentine carious lesion is diagnosed as active or there is increased risk that carious lesion activity will recur, it is advisable to support the treatment with a 38% silver diamine fluoride (SDF) or a 5% sodium fluoride (NaF) varnish therapy (third part). NRCC has been advocated, particularly in primary dentitions, for patients or parents who are able to accept responsibility for the disease and commit to remedial action including diet modification and regular, frequent tooth brushing with a fluoride toothpaste [7]. In the current

study, it was found that 66.3% of the respondents were practicing NRCC. Chemo-mechanical caries removal is a technique of cavity preparation where a chemical agent is applied into the carious lesion causing softening of carious dentine .Chemical softening of carious tissue can minimize the use of aerator for final restoration of the tooth.1In present study, 41.5% of the respondents were doing this method. In our study most of the dentists were practicing less aerosol generating procedures like Atraumatic Restorative Treatment (68.9%) and Interim Therapeutic restoration (51.3%). Similar study by Gianluca Gambarini et al. (2020) found out that 55% of Italian dentist implemented protocols to reduce the risk of aerosol contamination during COVID-19 pandemic [8]. During these Covid times, importance of preventive approaches increased. Most of the respondents were practicing preventive measures as routine to manage caries like fluoride varnish (69.7%), CPP-ACP agents (28.8 %), and antimicrobial agents (18.8%) and resin infiltration (11.4%).

Conclusion

The current scenario requires dental professionals to take necessary precautions which can minimize spread of Covid 19. Minimal invasive dentistry [MID] procedures involve minimal use of aerosol generating equipment's like air turbine, hence, they are more suitable treatment alternatives for dental patients in current times as they help in control of spread of infection. From this study, it is clear that most of the dentists are aware and practicing less aerosol practice. Most of the respondents recommend these less aerosol practice should be continued in this Covid scenario .It shows a paradigm shift towards a less aerosol practice.

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