



Risks of Dentistry in Covid 19 - A Review

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ABSTRACT

The recent spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and its association has gripped the entire community and has caused widespread public health concerns. There are various dental procedures that cause spread of the infection. There are risks due to lack of PPE, risks during dental procedure, risks involving handpiece, aerosols, droplets, during communication and contaminated surface. Minimum 30 articles were collected from Pubmed, Google Scholar. We acknowledge that due to lack of PPE, infection can spread more easily, oral surgery drills also cause aerosol and can be transmitted to the susceptible individuals. Communication between the patient and dentist has a high chance of infection transmission. Contamination from spatter and aerosol dissemination remains a significant hazard to dental personnel when high speed dental equipment is used. Dental practitioners have to be more careful while doing dental procedures as there is a high chance of risks for dentistry during covid-19 and proper guidelines should be there while doing dental procedures.

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INTRODUCTION

The recent spread of severe acute respiratory syndrome Coronavirus 2 (sars-cov-2) and its association has gripped the entire community and has caused widespread public health concern (Ather *et al.*, 2020). The virus is abundantly present in

salivary secretions of the affected patients, and is predominantly present in the environment and is spreading as respiratory droplets. Due to the characteristics of dental setting, the risk of infections is high between the patients and dental practitioners (Meng *et al.*, 2020). Patients with systemic Covid-19 have been the main source of transmission, Recent observation is also there that asymptomatic patients are also carriers of sars-cov-2 (Coello *et al.*, 2005). The spread of coronavirus has challenged the dentistry and medicine (Coulthard, 2020), and dental practitioners are advised to use the personal protective equipment, but due to the lack of availability risk is there. There are various dental procedures that cause spread of the infection. There are risks during dental procedures such as scaling, endodontic treatment, cavity preparation, extraction, filling and many more. Risks during procedure involving hand pieces, risks due to contaminated surfaces. All these things can cause risk to the dentist.

One of the previous studies shows that employers are failing to get personal protective equipment due to lack of availability (Jordan and Dolata, 2014). Patients of covid 19 usually have clinical symptoms of fever, dry cough and myalgia. The higher risk patients have symptoms of pneumonia or acute distress syndrome (Liang, 2020). Coughing or sneezing by an infected person can render sars-cov-2 airborne, potentially infected individuals in close contact.

The aim of the review is to signify the risks of dentistry during pandemic and to learn and prevent the dental practice from the coronavirus.

Retrieval of data

Review of literature by collecting and retrieving information for a minimum of 30 articles. Articles were selected from pubmed, google scholar.

Risks due to the lack of personal protective equipment

Due to the lack of personal protective equipment, transmission of infection is more easy and causes risk to the dentists. Due to the unavailability of PPE in various places, transmission has increased. WHO has recommended the use of masks to reduce the risk of transmission (Longrich, 2020). Regular surgical face masks used in dentistry when correctly worn by the dentists give good protection. Healthcare workers should wear the medical mask and PPE while entering a room where patients suspected or confirmed of being infected by Covid-19 are there. This reduces the risk of transmission.

Risks during dental procedures

During the procedure of scaling aerosols produced from the scalers can come in contact with saliva and transmission of infection could happen (Carmona, 2020). Dental drills cause the formation of aerosols and splatter commonly contaminated with bacteria, viruses, fungi and blood (Mathur et al., 2020).

During the extraction procedure blood contamination can cause transmission of infection from the patient. Cavity preparation using a handpiece for dental caries is the most common cause for the loss of enamel (Rajendran et al., 2019) and can be the cause of transmission of infection through the saliva of the patient's mouth (Cuero, 2020). One study reported that grape seed and cranberry extracts prevent enamel erosion (Nasim, 2018).

Oral surgery drills also cause aerosol in addition to splatter (Ishihama et al., 2008; Kumar and Antony, 2018). Use of ultrasonic scalers during non-surgical procedures can cause transmission of particles that can increase the risk to dentists (Frequently asked

questions, 2020) and during endodontic treatment (Ramamoorthi et al., 2015; Siddique, 2019) and dental avulsion (Rajakeerthi and Nivedhitha, 2019) and veneers (Ravinthar and Jayalakshmi, 2018). One of the studies demonstrated the diagnostic accuracy of dental pulse oximeters with a customized sensor holder, thermal test and electric pulp tester in assessing the actual pulp status and to evaluate the oxygen saturation level in control healthy teeth, non-vital teeth with irreversible pulpitis (Janani et al., 2020).

One study demonstrated that the restoration of noncarious cervical lesions (NCCLs) often poses a challenge to the clinician (Nasim and Nandakumar, 2018). Other procedures such as dental implants, Chlorhexidine have also been applied to medical devices such as dental implants, vascular catheters, needleless connectors and antimicrobial dressings (Noor, 2016). During fracture treatment dentists have to be careful and must follow the guidelines (Jose et al., 2020). Also during cleaning and shaping of root canal treatment (Teja and Ramesh, 2019) and placing matrices (Ramesh et al., 2018).

Risks during procedures involving hand pieces

Usage of high speed dental handpieces during dental procedures without anti retraction aspirate can expel the debris fluids (Carmona, 2020). Use of facemask can prevent airborne contamination (Tran et al., 2012). Contamination of saliva using a handpiece can cause the transmission of the infection (Herron et al., 2019). Risk of transmission of the virus is high using a hand piece during dental procedure due to saliva of the patient (Infectious Diseases Society of America, 2020). There is a risk of generation of contaminated aerosol (Fang et al., 2020). Dentists should minimise the use of ultrasonic instruments, rotary instrument (Ramanathan and Solete, 2015) high speed handpieces and 3-way syringes to reduce the risks of generation of contaminants aerosols

Risks during communication with patients

Communication between the patient and dentist has a high chance of infection transmission (Meng et al., 2020). Precautions should be there between the patient and dentist with proper guidelines (Wadia, 2020). Extra protective measures have to be taken while having conversation between the patient and dentist (Larson et al., 2000). To reduce the risk, telescreening can be used. That is initial screening via telephone to identify patients with suspected or covid-19 infection.

Risks due to droplets and aerosols

Aerosols are liquid and solid particles (<50um diameter) suspended in air for protracted time. It is a health risk to the dental team (del Rio and Malani, 2020). When performing dental procedures with a high speed handpiece, there is a friction between the tooth and rapidly rotating bur and creates heat generation. For prevention of the heat coolant are given that could generate aerosols and droplets. Aerosol can be transmitted to the susceptible individuals and droplets (>5um) can be contaminated to the inanimate objects (Ye et al., 1991). These aerosols and droplets can be contaminated by the virus and have the potential to float in the air and can be inhaled by the dentists and other patients (Vayssier et al., 1994).

Risks due to contaminated surfaces

Contamination from spatter and aerosol dissemination remains a significant hazard to dental personnel when high speed dental equipment is used (Bentley et al., 1939). Virus in the mouth and respiratory tract are transmitted during dental procedures and become aerosol contaminants that may cause infection transmission. By touching the contaminated surface with gloves can cause transmission of infection to the dental staff (Libin, 2018). Infection can be controlled by using personal protective equipment and by washing hands frequently. Dentists should use the rubber dam to minimise splatter. It may be advantageous to place the rubber dam as it covers the nose. When intraoral imaging is used, sensors should be double barriered to prevent perforation and cross contamination (Hokett et al., 2000; Manohar and Sharma, 2018).

CONCLUSION

Health care professionals have the duty to the patient and maintain high standards of care and infection control. This new emerging SARS-cov-2 threat has become common in the worldwide population. Dental practitioners have to be more careful while doing dental procedures as there is a high chance of risks for dentistry during covid-19 and proper guidelines should be there while doing dental procedures. Dental practitioners should have complete knowledge about spread control.

Conflict of interest

The authors declare that they have no conflict of interest for this study.

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