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REVIEW ARTICLE

HOLISTIC APPROACH ON DENTISTRY POST COVID-19- CRITICAL ASSESSMENT OF LITERATURE

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ABSTRACT

Background: An outbreak of novel coronavirus disease (COVID-19) in China has influenced every aspect of life. Healthcare professionals, especially dentists, are exposed to a higher risk of getting infected due to close contact with infected patients. Despite having a high standard of knowledge and practice, dental practitioners around the globe are in a state of anxiety and fear while working in their respective fields due to the COVID-19 pandemic impact on humanity. A number of dentist's have either modified their services according to the recommended guidelines to emergency treatment only or closed down practices for an uncertain period to decrease the risk of getting infected from patients and potentially spread it to their peers, families and other patients. **Aim:** This review aims at narrating some of the practically implementable SOP's (standard operating procedures) into the dental practice during this pandemic era along with a guidance in a holistic approach. **Methodology:** Literature search was done using key words, followed by inclusions and exclusions. **Results:** Based on the literature search and the author's experience, a working classification was made for ease in compilation and perseverance of data. **Conclusion:** Dental practices need to review their infection control policies, engineering controls, and supplies. Health care providers must keep themselves up-to-date about this evolving disease and allow dental care to be provided while mitigating the spread of this novel infection. Also personal care is very much essential for a dentist in this pandemic era.

INTRODUCTION

What makes Covid-19, a special concern for Dentist's

The outbreak of coronavirus disease 2019 (COVID-19) in the area of Wuhan, Hubei province, China has evolved rapidly into a public health crisis and has spread exponentially to other parts of the world. (1) WHO named the novel viral pneumonia as Corona Virus Disease (COVID19) on 11th February 2020. The International Committee on Taxonomy of Viruses (ICTV) suggested this novel coronavirus name as 'SARSCoV- 2' due to the phylogenetic and taxonomic analysis of this novel coronavirus. SARS‑CoV‑2 is a disease of animal origin, most probably from Chinese horseshoe bats (*Rhinolophussinicus*) with Malayan pangolins as the potential intermediate host (2). According to WHO, the virus that causes Covid-19 is mainly transmitted through discharge from nose or droplets from saliva when an infected person coughs, sneezes, or speaks. Since the droplets are often heavy to hang in the air, they tend to fall on dental chair, nearby instruments or on the floor. The risk of cross infection between a dental practitioner and a patient is high due to the characteristics of dental settings.

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For dental practices and hospitals in countries/regions that are (potentially) affected with COVID-19, strict and effective infection control protocols are urgently needed (3). Aerosols are particles less than 50 micrometers in diameter. Droplet sizes in Flugge range from <5 µm to 1000 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 the greatest potential for transmitting infections. Splatter is an airborne particle larger than 50 µm in diameter.

These particles or droplets are ejected forcibly from the operating site and arc in a trajectory similar to that of a bullet until they contact a surface or fall to the floor. These particles are too large to become suspended in the air. Dental research studies reveal that saliva to be involved in the close contact transmission of infectious diseases. Any normal person is bound to get quickly infected by inhaling the virus within a close range of 1meter of a Covid-19 infected person or by touching a contaminated surface and then by touching his/her own eyes, nose or mouth before washing hands. These risks can be attributed to the unique nature of dental interventions, which include aerosol generation, handling of sharps, and proximity of the provider to the patient's oropharyngeal region. This makes the working of a dental surgeon more precarious (3).

SEARCH STRATEGY: The following electronic databases were searched namely PubMed MeSH), Wiley online library,

Cochrane Library using key words (SARS-CoV-2, corona virus disease 19, COVID-19, Corona virus, Dentistry post covid-19, SOP for dentist, Dental practices, Pandemic). Based on the above literature search and the author's experience, the current review article aims at narrating the practically implementable SOP's (standard operating procedures) into the dental practice during this pandemic era in a holistic approach.

Inclusion criteria: Original research, review articles, case studies and textbook publications are included.

Exclusion criteria: Paid articles are excluded since the review is self funded.

RESULTS AND DISCUSSION

According to the American Dental Association, there are at least three potential sources of airborne contamination during dental treatment: Dental instrumentation, saliva and respiratory sources, and the Operative site. The probability of infection from viral exposure in respiratory diseases is proportional to both dose (viral load) and time (amount of time a susceptible host is exposed to the virus). (4,5)The lowest rate of viral shedding occurs during nasal breathing (4,6) ; during dental procedures, patients generally do not speak, shout or sing. Therefore, the potential viral dose is already quite low. This situation is dramatically different during inductive aerosol generating procedures. (7)

Holistic approach on Dentistry post COVID-19:

Working Classification: A,B,C,D,E,F,G

A- Aim to contain the outbreak
B- Basic hygiene measures at front desk
C- Creating awareness to public
D- Dental operatory safety
E- Ensure an individualized treatment flowchart
F- Frequent update with Covid-19 protocols
G- Gain immunity, combat fear and stress

A-Aim to contain the outbreak

It must be emphasized that no single approach or device can minimize the risk of infection to dental personnel and other patients completely. The most important aspect of being prepared is planning ahead.

- Adopt the concept of "Forward triage". It was designed for response to various types of crisis scenarios such as virus epidemics and catastrophes. Forward triage is the process of determining the patients' condition before they arrive in the emergency department. Direct-to-consumer telemedicine can enable patients to connect with their healthcare provider at a distance. This virtual approach provides remote monitoring which can help reduce the risk of clinician's exposure to infections. (8) CDC recommends telephone triaging of all patients in need for dental care.
- Dentist can opt to incorporate an individualized consent form (preferably an e -consent), encouragement of e-prescriptions and digital payment in practice.
- Dental care involves face-to-face communication with patients. Studies have suggested that 2019-nCoV may be airborne through aerosols formed during medical procedures. However, the aerosol transmission route and the fecal–oral transmission route concerned by the public still need to be further studied and confirmed. (9,10)

The chaotic flow of patients pose a unique challenge to the maintenance of quality of care especially in times of crisis and pandemics. Minimal overlapping of dental appointments should be ensured. According to guidelines given by Ministry of Health and Family Welfare dated 19 May 2020 and by CDC (Centers for Disease control and prevention) on 8th April 2020, only emergency and urgent procedures should be carried out and all routine and elective dental procedures should be deferred until the new policy/guidelines are issued. Practice modifications for emergency, urgent care, and specialty wise modification to be adopted as and when regular services resume.

B-Basic hygiene measures at front desk

Human coronaviruses such as SARS-CoV, Middle East Respiratory Syndrome coronavirus (MERS-CoV), or endemic human coronaviruses (HCoV) can persist on surfaces like metal, glass, or plastic for up to a couple of days. (1-3)Therefore, contaminated surfaces that are frequently contacted in healthcare settings are a potential source of coronavirus transmission.

- Dental practices derive droplets and aerosols from infected patients, which likely contaminate the whole surface in dental offices. Thus, keeping a clean and dry environment in the dental office would help decrease the persistence of 2019-nCoV. (9)
- CDC recommends installation of physical barriers (e.g, plastic or a glass window) at reception to limit close contact between triage personnel and potentially infectious patients. Also removal of toys, magazines and other objects that cannot be cleaned or disinfected from waiting areas.
- Dentists should support community physical distancing guidelines (minimum of 1-2 metres) to show risk reduction is feasible by physical distancing.(11). Hence avoidance of crowding at reception desk (with 6 feet inter-chair distance), providence of mask, gloves, hand hygiene measures (preferably a foot pedal operated hand sanitizer dispenser with 60-95% alcohol, or hand wash with soap and water for 20 sec; soap takes 20-30 sec for the lipid layer of the virus to die); followed by a detailed consent on signs and symptoms of covid-19; comorbid and travel history; along with usage of a non contact mode infrared thermometer, pulse oximeter and tracking of Covid-19 with usage of apps are advised. (12,3).
- Avoidance of patients with multiple bystanders (exceptions in kid and in old age with comorbidities, with whom one care taker is allowed) and to maintain a safe distance of 2m at the reception desk and while being seated.
- Patients who present with fever (.100.4 degree F5 38 degree C) and/or respiratory disease symptoms should have elective dental care deferred for at least 2 weeks. As per the Centers for Disease Control and Prevention guidelines, individuals with suspectedCOVID-19 infection should be seated in a separate, well-ventilated waiting area at least 6 ft from unaffected patients seeking care. (3)After informing the patients to self-quarantine

themselves, dentists should instruct the patients to contact their physician to rule out the possibility of COVID-19.Meticulous planning of procedures should be followed. Division of work schedule is a must since aerosols stay in the room for 10-30 min. (13)

C-Creating awareness to public

IDA (Indian dental association) and CDC recommends the usage of pictorial signs or visual alert boards and displays with appropriate instructions on hand hygiene, respiratory hygiene and cough etiquette at entrance area, elevators, cafeterias, etc. as shown in Figure 1,2,3 and 4. CDC do not recommend facemasks and cloth face coverings to be placed on young children under age 2, or anyone who has trouble breathing, or anyone who is unconscious, incapacitated or otherwise unable to remove the mask without assistance.

Figure 1: Covid-19 symptom chart at reception area

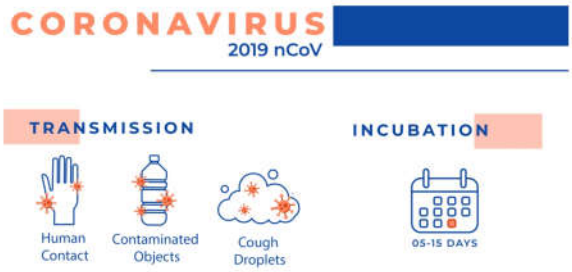

Figure 2: Covid-19 Transmission and Incubation chart

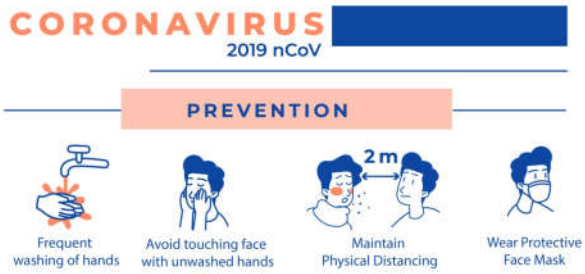

Figure 3: Covid-19 Prevention chart

D-Dental operatory safety

Patients with active febrile and respiratory illness will most likely not present to dental practices. Based on the assessment of emergency questionnaire clinicians can gauge the severity of the dental condition and make an informed decision to either provide or defer dental care (12). Application of personal protective equipment (PPE) such as masks, protective goggles, gowns, helmet, gloves, caps, face shields, and shoe covers is strongly recommended for all health care personnel. 2019-nCoV transmission in dental settings occurs through four major routes (11).

- Direct exposure to respiratory secretions containing droplets, blood, saliva, or other patient materials.
- Indirect contact with contaminated surfaces and/or instruments.
- Inhalation of suspending airborne viruses; and
- Mucosal (nasal, oral, and through conjunctivae) contact with infection-containing droplets and aerosols that are propelled by coughing and talking without a mask.

- Primary protection includes wearing disposable cap & surgical mask, working clothes (white coat), using protective goggles or face shield, and disposable latex gloves or nitrile gloves, which is advised for standard protection of the staffs in dental settings.
- Secondary protection includes wearing disposable doctor cap, disposable surgical mask, protective goggles, face shield, and working clothes (white coat) with disposable isolation clothing or surgical clothes outside, and disposable latex gloves for advanced protection for dental professionals. (9)
- Tertiary protection is for strengthened protection for dealing with contact patient with suspected or confirmed Covid-19 infection, which is most unlikely and they are not expected to be treated in a dental setting. (9)
- The effect of pre-procedural chlorhexidine rinse has not yet been demonstrated to be capable of eliminating 2019-nCoV. However, oxidative agents containing mouth rinses with 0.5% - 1% hydrogen peroxide or 0.2% povid one-iodine are recommended. None of these pre-procedural use of mouthwash, especially in cases of inability to use a rubber dam, can significantly reduce the microbial load of oral cavity fluids.(9)There is no substantial evidence through randomized controlled trials on humans on the efficacy of any pre oral rinse on prevention of covid-19, it thus reduces the contaminants and ensures proper oral hygiene.
- Disposable screening instruments can be used to reduce touch transmission.
- The most commonest mode of transmission of Covid-19 is through contaminated 'touch' surfaces, e.g. high risk touch surfaces. One need to ensure frequent cleaning of all touch surfaces including door handles, mobile phones, laptop, pen, prescription pad, switchboards, chairs, control panels, table clock, taps, keypad, etc.
- Extra oral radiographs can be preferred to avoid gag or cough reflex but an intraoral technique can also be followed with double barriers to prevent perforation and cross contamination.
- Minimal usage of ultrasonic instruments, high-speed hand pieces, and 3-way syringes to reduce the risk of aerosol production inside the operatory. Meticulous usage of rubber dam to minimize splatter generation. (3). It has been reported that the use of rubber dam could significantly reduce airborne particles in ~3-foot diameter of the operational field by 70%. (14)
- SARS CoV-2 can remain viable in aerosol and survive up to 3 days on inanimate surfaces at room temperature, with a greater preference for humid conditions. (15) Therefore, clinic staff should make sure to disinfect inanimate surfaces using chemicals recently approved for COVID-

19 and maintain a dry environment to curb the spread of SARS-CoV-2. (16)

- The safest zone for consultation is 2 meter away from the patient. Transmission of influenza can occur by coughing or sneezing where infectious particles of variable sizes, ranging from approximately 0.1-100 µm. Corona virus is 125 nano meter. Studies prove that protection with a surgical mask against influenza appears to be similar to the N95 respirator. (17) N95 is not made mandatory for routine screening of patients. A triple layered surgical mask can be worn by all health care providers within 1-2 meters of close proximity with patient. The N95 mask without a valve is for dentists who perform aerosol generating and blood splatter procedures. Also prolonged usage of N95 without recirculation between patients causes hypoxia, increased airway resistance and damage pulmonary circulation. (18)In regions with a high incidence of COVID-19, use of a universal face mask combined with physical distancing could reduce the rate of infection (flatten the curve), even with moderate effective masks.(19)
- Use of a high vacuum suction, and disinfection of patient impressions and lab works with 5.25% sodium hypochlorite is also advised. Chair water line, saliva ejector and high vacuum suction to be disinfected for 30 sec.
- Anti-retraction dental hand piece with specially designed anti-retractive valves or other anti-reflux designs are strongly recommended as an extra preventive measure for cross infection since studies show that the anti-retraction high-speed dental hand piece can significantly reduce the backflow of oral bacteria and HBV into the tubes of the hand piece and dental unit as compared with the hand piece without anti-retraction function. (20)
- The reusable instrument and items should be pre-treated, cleaned, sterilized, and properly stored. IDA recommends to treat waste contaminated with blood, body fluids, secretions and excretions as clinical waste, in accordance with local regulations. Human tissues and laboratory waste that is directly associated with specimen processing should also be treated as clinical waste. Single use items should be discarded properly.
- N95 masks can be kept in a UVGI steriliser at 254 nm wavelength, 8W UV light bulb, for 30 min or can disinfected by preheating oven at 75 degree C. The mask can be hanged such that both sides are treated. CDC recommends to store N95 in a clean, dry breathable container for 4 days at room temperature (5 mask reuse protocol for 20 working days). The face shield and eye protectors can be decontaminated using 0.5% Sodium hypochlorite and 70% alcohol. Disinfection of patient impression and other lab works can be done using Sodium Hypochlorite 5.25% diluted 1:10, mixed daily with exposure for 10min.
- The highest level of PPE, i.e., gloves, gown, goggles, face shields, and an N95 or higher-level respirator must be used during emergency dental care.N-95 masks by the national institute for occupational safety and health/FFP2 masks (filter face piece) set by the European Union are recommended.

Figure 4: Covid-19 General awareness poster

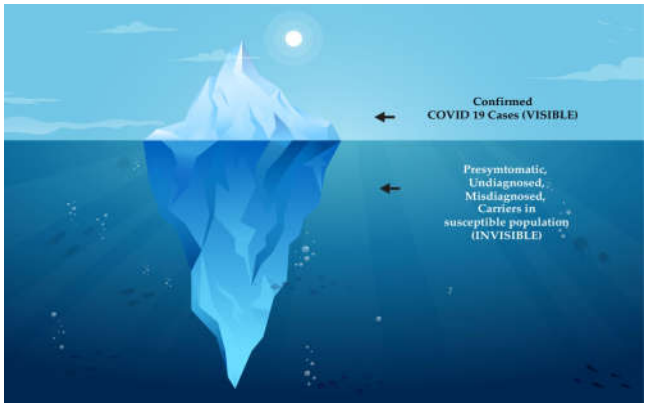

Figure 5: Ice berg concept in Covid-19

If available FFP3 (N-99) standard mask should be used and, in COVID-19 positive patients, this would be considered essential. Dentist must ensure that any reusable PPE is properly cleaned, decontaminated and maintained after and between uses, however soiled PPE should be disposed. Dental settings should also have policies and procedures describing a recommended sequence for safe donning and doffing PPE.A separate ventilated area for donning and doffing is mandatory to avoid contamination. After doffing, PPE gown can be washed in 50ml Sodium Hypochlorite in 5 litres of water and 10ml of liquid soap for 5-10min. All dental staffs must be trained and practiced the appropriate use of PPE and prevention of contamination of clothing skin and the environment during the process of removing such equipment. Covid-19 reinforced the importance of Aerodynamics in dentistry. CDC recommends Natural ventilation for infection control in health care settings. Any viral infection is dependent on dose and duration of exposure. Natural ventilation is the key. Dilution of air is recommended. According to recent CDC guidelines, disinfectant using spraying or fogging of chemicals (e.g., formaldehyde, phenol-based agents, or quaternary ammonium compounds) is not recommended in patient care areas due to adverse effects on health care workers. ACH (air change per hour or air exchange rate or air change rate) is a measurement of how many times a volume of air within a room will be added, removed or exchanged with filtered clean air. A minimum of 6 ACH per hour is recommended. Best is 10-12 ACH. Augmented ventilation is advised by circulating air every 10 min.

Use of a pedestrian or a wall mount fan and an exhaust fan is advised for exchange air. The exhaust air is most likely to contain particles carrying a viral load and hence a suitable technique should be deployed to prevent the spread of infections An exhaust fan of 9 inch diameter, above 1500rpm, above 400CFM (per 200sq ft) with a Db of 50-55 is advised, to create a unidirectional flow of air away from the patient. Treatment of exhaust air can be done preferably by HEPA filtration. (21) HEPA (high efficiency particulate air filter) 13 and 14 helps in air circulation and dilution of air. HEPA with carbon filter can absorb smoke and the smell of dentine. AC in the room can be modulated by placing a hepa filter onto the AC filter. HEPA filters can capture at least 99.97% of particles with a diameter greater than or equal to 0.3 microns. Covid is 0.1micron(size of a coronavirus particle is in the range of 80-160 nanometers).HEPA filters may be used for air purification. Maintenance of air circulation with natural air through frequent opening of windows and using an independent exhaust blower to extract the room air into the atmosphere is advised and to avoid using a ceiling fan while performing procedure. According to ISHRAE covid-19 guidelines, portable room air cleaner can help reduce the indoor concentration of contaminants through the action of dilution. But it cannot ensure protection from droplets and surface contamination.

UVGI (ultraviolet germicidal irradiation) is convenient to use and no chemicals are needed. It can kill all kinds of microorganisms including drug resistant bacteria, fungi, viruses and spores but it is dangerous to humans (avoid direct exposure especially skin and eyes). UVGI is an adjuvant dental clinics (not a stand alone technology) , but can be used for instruments (22). There is no evidence to demonstrate that fogging (No-touch surface disinfection: 20% (w/v) working solution of hydrogen peroxide, stabilized by 0.01% of silver nitrate)actually reduces the incidence of nosocomial infections. CDC do not recommend disinfectant fogging in between patients due to health hazards. There is no substitute for vigorous scrubbing and washing of surfaces to remove organic matter. Safety of repeated exposure of humans to disinfectant fog has not been established. DCI recommends periodic fumigation of dental clinics which can be done using a fumigator. Fumigation of clinics is a dentist choice since there are no studies to prove. It is usually done in hospital OT, so it cannot be done daily due to health hazards. Room decontamination with ozone mists and vaporized hydrogen peroxide can also be done. Surface disinfectants act as fumigators, hence can be used as a floor mopping (6ml in 1 ltr of water, allow contact time for 8-10min), surface cleaning (6ml in 1 liter of water with 2-5min of contact time) and as an aerial fumigation or fogging (10ml in 1 ltr of water, leave the room for 20 min after fogging, 1 ltr solution for 2000 cu.ft). The efficacy of alternative disinfection methods such as ultrasonic waves, high intensity UV radiation and LED blue light against covid is not known. CDC do not recommend the use of sanitizing tunnels. There is no evidence that they are effective in reducing the spread of covid-19. Chemicals used in sanitizing tunnels could cause skin, eye or respiratory irritation or damage. EPA recommends the usage of surface disinfectants.

Disinfection of surfaces and floor cleaning can be achieved by Phenolic compounds, aldehydes: glutaraldehyde, hydrogen peroxide and quaternary ammonium compounds with alcohols. No disinfectant can kill 100% germs. It reduces viral dilution or reduction. In floor cleaning, a vacuum cleaner is preferred and not a broom. One step disinfectant is preferred which contains both detergent and disinfectant. 1% Sodium hypochlorite is recommended with a contact time for 10min. A Mop with microfiber can be used since it has positively charged particles, and can attract bigger particles than a cotton mop. Fresh solution for each operatory is mandatory. Buckets to be washed with detergent, rinsed, dried and stored inverted when not in use. Surface barriers should be followed meticulously. The entire operatory units, dental radiology equipment, door knobs, hand piece control switches, headrest on dental chair, shade guides, light cure handle and tips, switchboard, supply container of dental materials, bracket tray or table, control panelsetc should be covered using disposables. A variety of barrier materials are available such as clear plastic wrap, bags, sheets, tubing and plastic-backed paper. Any barrier material chosen to be used on clinical contact surfaces must be impervious to both moist and fluid (23). Isopropyl alcohol can be sprayed over the plastic cover. Disinfectant wipes can be used to wipe all bottles in the operatory. Any barrier is considered a single use disposable device and must be discarded after every patient encounter and replaced with a new barrier at the end of each patient contact. Utility gloves should be worn while removing the surface barrier.

E- Ensure an individualized treatment flowchart

Avoid usage of dental handpieces, ultrasonic scalers and air/water syringe. A minimally invasive procedure can be incorporated inside the operatory. Non aerosol generating treatments can be followed meticulously like hand scaling, chemical plaque control, atraumatic restorative techniques with Glass ionomer cements, fluoride varnish, removal of caries with enzymes, Hall technique for primary tooth, use of biodentine, MTA, laser and microscope integrated dentistry (if equipped), etc. All procedures should be accompanied by frequent hand hygiene, use of PPE, sharp safety controls, safe injection practices, sterile instruments and devices, with clean and disinfected environmental surfaces. Since most of the consultations are met through online portals, an individualised drug prescription for emergency and elective dental treatment procedures according to each patient's co morbid history should be revised accordingly for an effective analgesic and an antibiotic effect (3). The usage of Ibuprofen during the COVID‑19 pandemic has not been contraindicated according to the current WHO guidelines. Because of conflicting research in this issue, the use of alternative medications to ibuprofen is suggested. Dentists can play a significant role in disrupting the transmission chain, thereby reducing the incidence of disease by simply postponing all non-emergency dental care for all patients. Dental professionals must be fully aware of 2019-nCoV spreading modalities, how to identify patients with this infection, and, most importantly, self-protection considerations (12).

F-Frequent update on Covid-19

It's the duty of a health care professional to know the pattern of pandemics in our community, the clinical symptoms and the treatment flowchart for self preparedness. According to the 'Natural history of disease model' by Leavell-Clark, Mausner and Kramer, every disease follows two stages or natural course of event. The first stage is the pre pathogenesis stage/ pre disease phase where the causative agent has not yet entered the susceptible host but the interaction between agent and host already exist in the environment.

Second phase refers to the pathogenic stage; which begins with the entry of the agent in the susceptible host. The clinical signs and symptoms range in severity from mild to moderate then severe to fatal. When these variations are graphically represented, these are called as Spectrum of disease. (24,25,26) John M Last first implemented the Iceberg concept to describe the pattern of identified and unidentified case of a particular disease in a community. It explains, when an iceberg floats on water, only the tip of ice is visible outside which represents only the diagnosed cases whereas major portion of the iceberg is submerged which denotes the undiagnosed cases with subclinical/pre-symptomatic phase, misdiagnosed cases, mild case and susceptible population (health workers, family members). (24,25,26) Figure 5 illustrates a diagrammatic representation of Ice berg phenomenon in Covid-19. There are no randomized double blinded controlled studies done in humans to evaluate the efficacy of Hydroxychloroquine in the prevention of Covid-19. (27) Usage of the drug has reduced signs and symptoms in rats and animals. The drug is not an antiviral agent. It is an anti malarial, and it competes with the virus, which results in the reduction of symptoms. ICMR recommends Hydroxychloroquine only for asymptomatic healthcare workers involved in the case of suspected or confirmed cases of covid-19 and asymptomatic household contacts of laboratory confirmed cases. Covid virus mainly enters by contamination of fingers, nose, and mouth (90% oro pharyngeal region), however the virus has been isolated from saliva and feces of infected persons. (28,29)There is no evidence that the viral load of the 2020 dental aerosols is more infectious than that of those previously encountered. The use of high volume evacuation and routine PPE has protected dentists, staff and patients from cluster infections. A recent study concluded that deep throat saliva has the highest rate of positive virus detection. The potential diagnostic value of saliva in detecting COVID‑19 virus is still under research.(30) Regular update of knowledge on various protocols is essential to practice an evidence based dentistry. In this pandemic era, a dentist is required to know the guidelines of WHO (The World health organisation), ADA (The American Dental association), CDC (The Centers for Disease Control and Prevention), MCI (The Medical council of India), DCI (The Dental council of India), ICMR (Indian Council of Medical research), IDA (The Indian dental association), ASHRAE (American society of heating, refrigerating and air conditioning engineers), Ministry of Health and Family Welfare (MOHFW),ISHRAE (Indian society of heating refrigerating and air conditioning engineers) and OSHA (Occupational Safety and Health Administration) for a safe practice.

G. Gain immunity, combat fear and stress

Although the mortality associated with COVID-19 is low, it has a high spreading potential . Since the COVID-19 outbreak is so fast and devastating, many countries have shut down teaching institutions, social gatherings, sports activities, etc in an attempt to control the spread of the infection. Fear and anxiety are powerful emotions that may be associated with the overwhelming reports on the COVID-19 pandemic by social, electronic, and print media. At the current juncture, people with persistent anxiety may panic and are more likely to make mistakes leading to irrational decisions and behaviour. Being on the list of high-risk professions, dentists are very much expected to develop severe anxiety about the current pandemic situation (31). Most of the practicing dentists are in a dilemma. Every week a dentist is bombarded with multiple recommendations and guidelines across the globe. A practicing dentist is in a burn out situation facing emotional exhaustion, increased mental distance from one's job, feeling of negativism or cynicism to one's job or reduced professional efficacy. Where on the other hand a dentist attached to an institution is being overloaded with online classes, multiple webinar sessions with disturbed work schedules and sleep pattern. Few dentists spend with family, indulge into fitness or in research activities during the lockdown period. A group of young dentists do get involved in almost all the social media sites showcasing their hidden talents. Psychological trauma in healthcare workers also includes the fear of getting infected while treating an infected patient, or infecting a family member. The burden on the healthcare system and cost incurred during treatment also puts one's mind at stress. Health facilities may not be state-sponsored globally and hence can result in a significant financial burden. (31)

COVID-19 has spread globally and on 11thMarch 2020, the WHO declared it as a controllable pandemic disease. (31). Till date, there is no vaccine available, which further enhances the anxiety. On 16th March 2020 the first clinical trial was initiated by the National Health Institute (NHI), USA. Till now patients are relying on supportive therapy such as vitamins A, C and D; chloroquine phosphate; and general healthcare until the body's immune system can eradicate the infection. (31)Considering the vital role of the body's immune system, elderly patients with chronic debilitating diseases have a higher risk of getting infected compared to young, healthy individuals with a strong immune system. (32) Personal care is very much essential in this pandemic era. Adequate sleep, nutrition, exercise, indulging in hobbies, relaxation, meditation, a good work life balance, recognition and rewards, mentoring, supportive work community, professional discussions, social connectedness, teamwork, teaching and improvement of communication skills are few practices to combat burn out and to improve self confidence. The consumption of foods rich in vitamins and of functional foods can boost the immune system. Ascorbic acid (Vitamin C) is a protective vitamin. It supports the immune function and is necessary for the development and repair of tissues. Foods rich in Vitamin C include citrus fruits, kiwifruits, and broccoli. Other vegetables, like carrots, spinach, and sweet potato, are rich in Vitamin A. This vitamin comprises a group off at-soluble compounds (including retinol, retinoic acid, and _-carotene) that play an essential role in the immune function and are known to lower the susceptibility to infections. For instance, isotretinoin (a derivative of vitamin A) mediates the down-regulation of angiotensin-converting enzyme 2 (ACE2), which is a crucial host cellular protein required for the entry of SARS-COV-2 in the body (33). Besides, supplementation with Vitamins D and E may boost our resistance to COVID-19 (34), as the decrease in cattle's levels of Vitamins D and E could lead to infection by a bovine coronavirus. (35) Das (36) suggested that the oral or intravenous administration of bioactive lipids (such as arachidonic acid and other unsaturated fatty acids) may aid in enhancing resistance and recovery from SARS-CoV-2, SARS, and MERS infections. Natural polyphenols such as hesperidin and rutin acts as antioxidants. Nowadays, supporting the immune system is among consumers' top health goals globally. In fact, almost one in five consumers listed immune system support as the number one reason for purchasing healthy products in a recent consumer survey (Nutraceuticals world, 2019; (37). In the new era of the COVID-19 pandemic,

it is foreseen that consumers will increasingly seek products to boost their immune system in the future.

Author's Conclusion

There is a good chance that a dentist might treat an asymptomatic COVID-19 patient since the average incubation period is estimated to be around 0–14 days (generally adopted duration for quarantine and medical observation of potentially exposed persons) and few patients only develop symptoms. (38)Thus, every patient should be considered as potentially infected by this virus, and all dental practices need to review their infection control policies, engineering controls, and supplies. Health care providers must keep themselves up-to-date about this evolving disease and provide adequate training to their staff to promote many levels of screening and preventive measures, allowing dental care to be provided while mitigating the spread of this novel infection. It is advisable to assess the emergencies on a case-by-case basis and use clinical judgement to aid in decision making. Health care professionals have the duty to protect the public and maintain high standards of care and infection control. It is important to educate the public to prevent panic while promoting the health and well-being of our patients during these challenging times. The prudent practitioner will use this review as a starting point and continue to update themselves with useful online information as this outbreak continues. As presented in this review, judicious pre screening protocols along with incorporation of physical distancing, face mask use, and high standard of infection control with other interventions are needed to mitigate the COVID-19 pandemic until we have an effective vaccine.

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