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Review Article

Combating Novel COVID-19: Guidelines for the Periodontal Practitioner

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Abstract

In the history of medicine there have been many outbursts of morbid infectious diseases and it is challenging to every health care professional to reduce and prevent its burden. The field of Dentistry is always a source of high-risk infectious material generation owing to its professional nature. Most of the morbid infections are viral in origin and quite often transmit via droplet or aerosols. In this context, the field of Periodontology is not an exception. The recent pandemic spread of novel corona virus infectious disease (COVID-19) is alarming the community and has gained focus in terms of prevention at each echelon in the chain of transmission of infection. It becomes a mandatory duty as responsible clinicians in combating against the spread of such an infection.

Keywords: COVID-19; Periodontal guidelines; Periodontal color coding

Key messages: It is well known that universal precautions be applied in day-to-day periodontal practice. In addition, specific precautions are recommended to Periodontists in terms of patient management protocols at various phases of periodontal treatment.

Introduction

The incidence of global pandemic caused by the novel coronavirus is alarmingly increasing in India. The rapidity of development of clinical illness and difficulty in management poses a significant challenge to the specialists. The infection is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case of this pandemic was reported in Wuhan, China and vastly spread across continents of the globe. With the given scenario of spreading infection, dental professionals are at high risk for hospital acquired infections (HAIs) and thereby becoming a potential carrier in future. The unique nature of periodontal therapy involves extreme aerosol generation, sharps handling and close proximity to Oro-nasopharyngeal droplet foci, which raises the need for the specialists to modify the existing periodontal treatment modalities for counterbalancing the pandemic situation. The aim of this review is to provide an overview of prevention of transmission of infection during the present public health emergency of global concern, corona virus (COVID-19) infection.

Problem background

India had been affected in the past by pandemic of plague leading to Black Death and even swine flu. Presently, our country is effectively fighting another unprecedented pandemic, COVID-19 caused by SARS-CoV-2. It was already recognized in the past that social distancing is an effective way to reduce the impact during such situations. However, there always remains a submerged portion of the ice berg of cases, who are asymptomatic carriers of the virus. Hence, the periodontal professionals need to be very effective in combat-

ing the identification, differentiation, preventing transmission and breaking the chain of infection, given the burden of high intensity in densely populated country like India.

Overview of SARS-CoV-2

CoV-2 is a single stranded RNA Virus belonging to the family of beta corona virus and acts through structural spike protein (S protein) which interacts with Angiotensin Converting Enzyme-2 (ACE2) receptors located in lungs, intestine and salivary glands. The virus enters the host cell through S protein and synthesizes the viral RNA. The novel COVID-19 infection has an incubation period of 0-24 days and spreads via droplet infection, aerosols, fomites and faeco-oral route. It is presently very difficult to predict the transmission potential of the virus as it undergoes self-mutation [1]. Therefore, in addition to the routine universal precautions, special mandatory protocols are to be adhered during periodontal care. Periodontal therapy involves various phases of treatment and each stage has its own implications in infection control protocol.

Preparation of the periodontal clinic

The clinic should exhibit info graphics pertaining to CoV-2, cough etiquettes and prevention of COVID. The operatory always holds a potential risk of contamination by aerosols (0.001μm), droplets (10μm) and splatter (greater than 100μm) [2]. Thus, it becomes mandatory to daily disinfect all the surfaces using virucidal disinfecting agents like 1% Hydrogen Peroxide, 0.2% Povidone Iodine,70% or more Iso-propyl alcohol and 1% Sodium Hypochlorite (NaOCl). A two-minute exposure to 1% NaOCl to was found to be effective for viral inactivation [3]. A study which investigated 0.01% NaOCl and ethanol for dental waterline disinfection concluded that, 0.01% NaOCl was effective in inactivation of most infectious agents including viruses. Such a low concentration of NaOCl in dental waterline was well tolerated by the patients as well [4]. But it has to be mentioned that the exact action of NaOCl on viruses is still unknown. It was shown that CoV2 can survive on inanimate surfaces from 2h to 9 days, especially when the relative humidity is 50% or more [5]. It is suggested to maintain a dry clinical environment avoiding the usage of air conditioners. Invariably all the instruments have to be sterilized only by autoclaving since it is known that viruses can retain their infective potential over fomites for many days [6].

The periodontal clinic should have a standardized operating protocol (SOP) and also should ear mark one staff as the Infection Control Officer (ICO). The entire periodontal team should be well versed with all the contents of the SOP. The SOP is a dynamic document and has to be updated time to time with the latest evidence available. The ICO shall ensure that the periodontal team undergoes daily temperature screening using noncontact infrared thermometer before entering the clinic and all the protocols of SOP are being followed. A daily emphasis of the donning – duffing drill in specific order as mentioned in the SOP has to followed. The reception, waiting area and operatory may have air purifiers/UV light disinfector/HEPA filters whenever feasible, however evidence on the same is inconclusive. The seating arrangement in waiting area should be specifically designed to maintain inter-personal distance of at least 2meters. The belongings of the patient should be be deposited at reception in sealed disposable covers.

Patient registration

According to Indian Dental Association recommendations all the attendees of the periodontal clinic should follow the hand washing protocol with soap and water or with alcohol-based hand sanitizer before registration. A detailed step by step info graphic of hand hygiene should be displayed. The patient and the visitor should be emphasized to wear face mask irrespective of their COVID/medical history, if not wearing a mask already, the same shall be issued at entry point. It is suggested to do digital registration and online payments using smart wireless gadgets thereby avoiding usage of stationery which is difficult to disinfect. The temperature of both patient/attenders has to be evaluated using a non-contact infrared thermometer [7].

Screening forms

All the patients and their accompanies should be allowed to do the documentation as follows;

(i) Complete demographic details of both patient/attender as a measure to achieve contact tracing as and when required.

(ii) Travel / Contact history questionnaire

(iii) Self-medical history declaration for specific symptoms

(iv) The existing consent form for patients has to be modified providing the details of risk of CoV-2, being a significant medico-legal implication to the periodontist.

Preparation of the patient

All the patients should invariably be prepared using personal protective equipment's (PPE) including disposable patient gown, disposable hand gloves, head cover and shoe cover. Proper draping and extraoral skin preparation using 5% povidone-iodine or alcohol based chlorhexidine (CHX) is mandatory. A preprocedural mouth rinse reduces the bacterial load of oral cavity being a potentially contaminated aqueous environment [8]. AlthoughCHX is considered as the gold standard mouth rinse, the effect of the same on CoV-2 is unknown. It has been shown that 0.2% Povidone – Iodine or 1% hydrogen peroxide was found to be effective in 94% reduction of the oral viral load. A 0.05% NaOCl mouth rinse resulted in significant reduction in plaque formation, however effect of the same on CoV-2 is unknown [9].

Preparation of the personnel

Ministry of Health and Family welfare recommends that all the personnel involved in emergency medical relief should undergo proper hand washing, scrubbing and donning-duffing protocols with necessary PPE [10]. The PPE includes four levels of protection and their applicability based on the trade work is depicted [Table 1] [11]. The COVID risk scoring and the implications of PPE levels are presented [Table 3]. It is obvious that the comfort level will be affected with full level PPE (Level A), but the same is indispensable in the present pandemic situation.

Level	*Protection needed*	*Components of PPE*	*Applicability to Periodontal Team*
Level A	Highest level of respiratory, skin, eye and mucous membrane protection	Positive pressure respirator with exhalation control (N95 mask), face shield, full body encapsulating suit with inner and outer gloves, boots with shoe cover	Periodontist Dental Hygienist
Level B	Highest level of respiratory protection and lesser skin, eye and mucous membrane protection	Positive pressure respirator with exhalation control, (N95 mask), face shield, chemical resistant clothing, head cover, inner and outer gloves, boots with shoe cover	Operating room assistant
Level C	When skin and eye exposure is unlikely	Full face mask / Triple layer surgical mask, chemical resistant clothing with inner and outer gloves and boots	Housekeeping staff
Level D	When working precludes aerosols, splatter, droplet sources	Triple layer surgical mask,Coveralls,hand gloves and safety boots	Receptionist & Clerical staff

Table 1: Levels of personal protective equipment.

Periodontal management

As per Center for Disease Control (CDC) criteria, all the periodontal patients who present with suspicious respiratory symptoms shall be deferred from all forms of elective periodontal treatment up to 3 weeks [12]. A periodontal procedural color coding is proposed to effectively combat the pandemic situation [Table 2]. The 'grey zone' depicts the COVID risk scoring criteria and if the total score is 3 or more should alarm the periodontist and the treatment has to be deferred for next 21 days. Later, the periodontal treatment should only be performed after an opinion has been obtained from physician. Hence the suggested 'cut off' risk score for performing periodontal treatment is 2. The periodontal treatment color coding proposed in this model are green code, amber code and red code. All the codes

of periodontal treatments can only be safely performed only if the risk score is 2 or less and with extreme precautions as coded in the levels of PPE accordingly [Table 3]. The 'green code' of procedures implies all the procedures which can be performed safely without compromise in the aseptic protocols. The 'amber code' of periodontal procedures should be performed with caution, only if absolutely necessary for the benefit of the patient and with highest level of PPE possible. The 'red code' of periodontal procedures should ideally be postponed during the pandemic situation.

COVID Risk Scoring	*Periodontal Procedure Coding*		
'Grey Zone'	*'Green Zone'*	*'Amber Zone'*	*'Red Zone'*
Travel history Score 1	Periodontal examination including probing	Incision and drainage	Restorative therapy using airotor
	Hand scaling / root planing	Extraction of hopeless teeth	Access opening for endodontic therapy using airotor
Body pain / Fatigue Score 1	Local drug delivery	Curettage	Ultrasonic supragingival scaling
Medical co-morbidities Score 1	Systemic antibiotic therapy	Access opening using micromotor	Ultrasonic subgingival scaling and root planing
Sore throat / Cough Score 2	Host modulation therapy	Open flap debridement	Polishing of teeth
	Atraumatic restorative treatment or chemical caries removal	Regenerative osseous surgery	Piezosurgical procedure
Breathing difficulty Score 2	Chemomechanical preparation	Resective osseous surgery	Crown or abutment preparation in restorative phase using airotor
	Splinting	Periodontal plastic surgery	
Fever Score 2	Minor orthodontic tooth movement	Minor procedures in SPT	Implant placement surgery
Contact history Score 3	Review examination for SPT	Intra oral imaging	Advanced implant surgery
	Teleconsultation for SPT	Laser procedure	
Previous history of Covid-19 Score 3	Extra oral imaging	Electrosurgical procedure	All surgical procedures in immune- compromised patients
Present Covid illness Score 5	Oral health education using online tools	Second stage surgery – Minimally invasive exposure of implant	All surgical procedures in COVID positive patient
Total score more than ≥ 3, Postpone all types of treatments	Self-assessment of oral hygiene using plaque disclosing agent	Autogenous soft tissue graft harvesting for any procedure	All surgical procedures in recently recovered COVID patient
	Smoking cessation counselling	Autogenous bone harvesting for any procedure	

Table 2: Periodontal procedural color coding in COVID-19.

'Grey Zone'	*'Green Zone'*	*'Amber Zone'*	*'Red Zone'*
Score more than ≥ 3 – as Red zone	Safe zone	Caution zone	Danger zone
Score less than ≤ 2 – as Green zone or Amber zone as applicable	Level A PPE for Periodontist /DH Level B PPE Assistant	Level A PPE for Periodontist / DH/ Operating room assistant	Postpone all types of treatment

Table 3: Color coding – Risk zones and their implications.

It is understood that periodontal treatment is a never-ending process since the therapy in a diagnosed periodontitis patient continues for lifetime of the patient. Hence, provision of routine periodontal care during the ongoing pandemic seems illogical. The primary moral response is to save lives and to contain the infection. However, it becomes imperative that the periodontist be prepared with specific modifications to prevent and control the spread of COVID-19. Periodontal emergencies like acute gingival/periodontal abscess, acute pericoronitis, necrotizing ulcerative gingivitis (NUG), herpetic gingivostomatitis should be managed with extreme precautions following risk evaluation and PPE protocols. In emergency phase, incision and drainage of abscess, root canal opening with micro motor under rubber dam or chemical caries removal may be performed. For emergency patients, who require initial therapy as in NUG, it is recommended to use hand instruments and perform only supragingival scaling. Systemic antibiotics in the pre-operative phase should be reserved only to patients who present with systemic signs of periodontal infection [13]. Extraction of hopeless teeth being a non-aerosol producing treatment can be performed only if the risk score is ≤ 2. All the elective cases of initial therapy should be preferably be postponed, considering the concrete data that, in a cohort with absolutely no oral hygiene measures, only 8% of the population without periodontal care showed severe attachment loss over a period of 15 years [14]. Studies showed that ultrasonic scaling is superior to hand scaling in terms of flushing action, endotoxin reduction and time consumption [15]. Although most patients (74%) show a strong preference to ultrasonic scaling, it is absolutely contraindicated because of the huge risk of transmission of infection through aerosols, droplets and splatter [16]. With the available evidence it is found that both ultrasonic scaling and hand scaling can efficiently interrupt biofilm formation with no significant difference between the two when performed efficiently [17]. For those patients who had already completed initial therapy, shall be continued on prolonged maintenance phase, as it is evident from the literature that the success of periodontal therapy depends on the quality of periodontal debridement rather than surgical or non-surgical technique used [18]. All other patients who are due for surgical therapy and restorative therapy should invariably be postponed, unless warranted by an extreme urgency which is nearly zero in periodontal practice. In such a rare necessity, closed curettage using hand instruments is preferred to open flap debridement. In a study, which compared curettage with osseous recontouring, it was found that there was comparable improvement in periodontal health with both the techniques [19]. All the restorative procedures which necessitate operation of aerosol producing instruments should definitely be postponed. For patients who were due for maintenance phase should preferably be managed with a telephonic consultation or video conferencing to provide essential home care advice thereby avoiding the visit of such patients to periodontal clinics for supportive treatment. For select situations of maintenance patients (whose risk score is ≤ 2) in whom the sites which present with continuing attachment loss, should be treated locally using area specific hand curettes and local drug delivery may be administered if the probable pocket depth is ≥ 6mm [20].

Periodontal care in relation to COVID-19 patients

Ideally periodontal treatment in an active COVID positive patient has to be postponed. In case of a recently recovered COVID patient, the periodontal treatment should be postponed for at least 6 weeks from the date of recovery. When a recently recovered COVID patient is encountered all the staff has to be notified and contact log has to be updated. All the staff who came in contact with such a patient should be quarantined for minimum of 14 days after such notification. Isolation in a hospital will be necessary if symptoms develop. Fumigation using 12% Hydrogen Peroxide with 0.02% Silver Nitrate or with 35 ml of formalin in 10gm of Potassium Permanganate per 5 square feet is mandatory after an encounter with positive or recently recovered COVID patient, even if no periodontal treatment was performed. The periodontal clinic should remain closed after fumigation and should not be opened before 48 hrs. In case of unprotected exposure, administrative and local health authorities have to notified immediately and self-quarantine is strongly

recommended along with wearing of protective masks even during the quarantine period. For all the periodontal patients who were "close contacts" of a known COVID case, any form of treatment should be postponed as the COVID risk score becomes 3. There is a dilemma, when it comes to periodontal management of asymptomatic patients (recovered cases who do not present history or asymptomatic carriers) as the infectivity of such patients is unknown. In such cases, when in doubt, treatment should be postponed and only when unavoidable it has to be modified as suggested green zone [Table 2].

Laser and Radiosurgery

As a sole procedure laser have shown 'minimal evidence' in periodontitis management and a position statement concluded that the results are unpredictable and inconsistent when used as a monotherapy [21]. In addition, the application of laser and electrosurgery leads to generation of 'plume' [22]. Such smoke was shown to transmit viral DNA [23]. Hence a high vacuum suction is indispensable with laser / electro surgery and it is presently uncertain whether CoV-2 can be transmitted through the plume. With the present available evidence, it cannot be ascertained, as whether lasers or electrosurgery offer a safe treatment alternative to conventional periodontal treatment modalities.

Piezosurgery

Piezoelectric devices work on the basic principle of ultrasonics. The advantages of piezosurgery such as greater visibility, reduced bleeding is due to the 'cavitation effect' because of ultrasonic micro vibrations [24]. Hence, they are absolutely contraindicated because of the risk of transmission of infection through generated aerosols.

Implant Surgery

Recently, a retrospective cohort study was done to review the clinical outcomes of various surgical procedures of varying complexity in patients who were asymptomatic prior to surgery but with a direct exposure to Wuhan city. All the patients quickly manifested clinical features of COVID-19 immediately after completion of the surgery suggesting that, surgery may accelerate and exacerbate disease progression [25]. It was highlighted that patient's immune function is one of the major determinants of outcome in Cov-2 infection [26]. It is well known that a surgical procedure can trigger a systemic inflammatory response and can cause transient impairment of the immune function. Hence it is suggested to avoid all implant surgical procedures however, for patients who require exposure of previously osseointegrated implants at second stage, can be performed if the risk score is ≤ 2.

Post-operative medications

The analgesic of choice for most periodontal patients is acetaminophen and it is advisable to avoid ibuprofen according to CDC as the drug interferes with immune regulation [27]. It was known that the rate of post-operative periodontal infections was only about 2% on an average [28]. Hence, post-operative antibiotics for infection prevention should be prescribed judiciously and usually the requirement is less when all the aseptic protocols were followed.

Periodontal viruses and CoV2

Traditionally periodontitis was earlier considered as a bacterial infection. With the unexplainable reasons for site specificity of the disease other etiological agents including viral etiology in periodontal disease was elucidated. By invasion, replication inside the host cells, the viruses are able to alter the host immunity of the periodontal tissues. Latency is a characteristic feature of viruses and leads to reactivation / recurrence of lesions [29]. At present, it is unknown, whether CoV-2 can cause infiltration and invasion into the periodontal tissues from the saliva of COVID-19 patients.

Prophylaxis against COVID-19 for periodontal team

Presently there are numerous ongoing drug trials for COVID prophylaxis among health care workers (HCWs). At present there is no clear-cut scientific evidence to support the use of hydroxychloroquine (HCQ) prophylaxis in HCWs. However, the rationale for its use

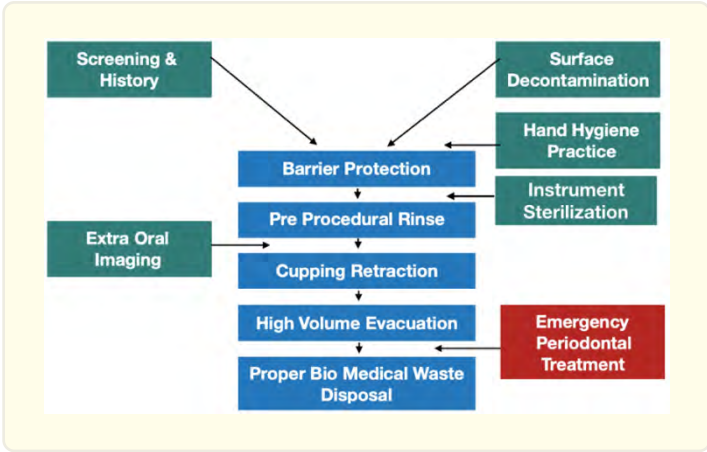
in clinical trials is based on the in-vitro ability of HCQ to inhibit viral replication. The FDA authorized the use of HCQ only in diagnosed COVID-19 case and not for prophylaxis in HCWs until further evidence. Only randomized controlled clinical trials will be able to show us the efficacy of HCQ for COVID prophylaxis [30]. The periodontal team should consider prophylaxis with HCQ only after seeking advice from physician who might advise the same based on the emergence of day-to-day evidence. Until then, a strict aseptic protocol along with a modified periodontal approach with all necessary precautions should be adhered to.

Post treatment of the periodontal clinic

Surface disinfection as in preparation of the clinic has to be repeated. It is known that operation theatres (OT) with laminar flow patterns definitely reduced the micro-organism laden aerosols by sixty times when compared to conventional OT [31]. The periodontal clinic is a minor OT which carries high risk of airborne infection of the ongoing pandemic. It is suggested that daily fumigation of the operatory is necessary in clinics in which OT ventilation system is not installed. The appointment scheduling of periodontal patients has to be taken care of, considering the minimum time required for fumigation process [32]. The Biomedical Waste Management Rules, 2016 has to be followed along with usage of double layered bags to ensure no-leaks during waste disposal [33].

Cost effectiveness

Considering serious concern of the pandemic, a 'modified layering of protective procedures' is suggested for the periodontal team during all the phases of treatment as depicted (fig.1) [34]. The total cost of periodontal treatment is likely to escalate in near future, but the overall benefit definitely outweighs the risks involved, given the high mortality of COVID-19. At present many organizations are being commissioned to develop cost-effective PPEs without compromise in the quality and safety. As on date, there is no universal consensus on retreatment and reusage of PPE. As an interim measure to combat the emerging rise in infection rates, CDC recommends that, the dental treatments are to be prioritized and the clinician should be the decision maker on individual patient basis. Hence it is suggested that periodontists should be regularly updated with the recommendations that will likely emerge as the pandemic evolves during forthcoming several weeks to months as directed time to time by CDC, Ministry of Health and Family Welfare and other professional and specialty governing bodies [35].



Mental robustness

The rising pandemic situation and the existence of potential asymptomatic carriers, latency and reactivation of CoV-2 creates insecurity to the practitioners. The efficiency of mental aptitude reduces in periods of anxiety, fear and stress. Nevertheless, studies showed that pandemic preparedness can be achieved by efficient training and willingness to work and was directly proportional to stewardship and robustness [36]. Such mental anxiety can be gradually diminished by effectively practicing the necessary aseptic protocols.

Conclusion

Periodontal therapy is an integral part of routine dental practice. The purpose of this review is to throw light on the modification of standards of treatment and protocol to be adhered in daily periodontal practice. There is high calling for practicing periodontists to actprudently to protect their patients and themselves and their staff members, by maintaining high standards of infection control. There is a torrent of scientific evidence pouring in everyday on COVID-19 and the recommendations change in accordance with the rapidly evolving pandemic situation. It is necessary that all health professionals who are warriors in frontline shall keep themselves updated with the current knowledge, to effectively combat the emerging crisis and keep themselves and their team safe and also provide safe and effective patient care throughout.

References

1. Sabino – Silva R, Jardim ACG and Siqueira WL. "Corona virus COVID-19 impacts to dentistry and potential salivary diagnostics". Clin Oral Investig 25 (2020): 257-63.
2. Miller RL, Micik RE, Abel C and Ryge G. "Studies on dental aerobiology: II microbial splatter discharged from the oral cavity of dental patients". J Dent Res 50 (1971): 621-5.
3. Tsiquaye KN and Barnard J. "Chemical disinfection of duck hepatitis B virus: A model for inactivation of infectivity of hepatitis B virus". J Antimicrob Chemother 32 (1993): 313-23.
4. Ceisel RJ, Osetak EM, Turner DW and Spear PG. "Evaluating chemical inactivation of viral agents in hand piece splatter". J Am Dent Assoc 126 (1995): 197-202.
5. Miller RL, Burton WE and Spore RW. "Aerosols produced by dental instrumentation. In: Proc First Int Symp Aerobiol". Oakland, Naval Biological Laboratory and School of Public Health (1963): 97-120.
6. Peng X, Xu X, Li Y, Cheng L, Zhou X and Ren B. "Transmission routes of 2019-nCoV and controls in dental practice". Int J Oral Sci 12 (2020): 1-9.
7. Indian Dental Association's preventive guidelines for dental professionals on the corona virus threat. Mumbai,IndianDental Association (2020).
8. Gjermo P, Bonesvoll P and Rölla G. "Relationship between plaque-inhibiting effect and retention of chlorhexidine in the human oral cavity". Arch Oral Biol 19 (1974): 1031-34.
9. De Nardo R, Chiappe V, Gomez M, Romanelli H and Slots J. "Effects of 0.05% sodium hypochlorite oral rinse on supragingival biofilm and gingival inflammation". Int Dent J 62 (2012): 208-12.
10. Novel Coronavirus Disease 2019 (COVID-19): Guidelines on rational use of Personal Protective Equipment. Ministry of Health and Family Welfare, New Delhi (2020).
11. United States Department of Health and Human Services. Levels of PPE. Chemical hazards emergency medical management (2020).
12. CDC Guidance for Providing Dental Care during COVID-19. Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion (2020).
13. Herrera D, Roldan S and Sanz M. "The periodontal abscess: a review". J Clin Periodontol 27 (2000): 377-86.
14. Loe H, Anerud A, Boysen H and Morrison E. "Natural history of periodontal disease in man. Rapid, moderate and no loss of attachment in Sri Lankan laborers 14 to 46 years of age". J Clin Periodontol 13 (1986): 431-45.
15. Drisko CH. "Root instrumentation. Power-driven versus manual scalers, which one". Dent Clin North Am 42 (1998): 229-44.
16. Croft LK., et al. "Patient preference for ultrasonic or hand instruments in periodontal maintenance". Int J Periodontics Restorative Dent 23 (2003): 567-73.
17. Drisko CL., et al. "Position paper: sonic and ultrasonic scalers in periodontics. Research, Science and Therapy Committee of the American Academy of Periodontology". J Periodontol 71 (2000): 1792-801.
18. Caffesse RG, Sweeney PL and Smith BA. "Scaling and root planing with and without periodontal flap surgery". J Clin Periodontol 13 (1986): 205-10.

19. Smith DH, Ammons WF Jr and Van Belle G. "A longitudinal study of periodontal status comparing osseous recontouring with flap curettage. I. Results after 6 months". J Periodontol 51 (1980): 367-75.
20. Greenstein G. "Local drug delivery in the treatment of periodontal diseases: Assessing the clinical significance of the results". J Periodontol 77 (2006): 565-78.
21. American Academy of Periodontology statement on the efficacy of lasers in the non-surgical treatment of inflammatory periodontal disease. J Periodontol 82 (2011): 513-14.
22. McKinley IB Jr and Ludlow MO. "Hazards of laser smoking during endodontic therapy". J Endod 20 (1994): 558-59.
23. Garden JM, O'Banion MK, Bakus AD and Olson C. "Viral disease transmitted by laser-generated plume (aerosol)". Arch Dermatol 138 (2002): 1303-07.
24. Roy RA, Ahmad M and Crum LA. "Physical mechanisms governing the hydrodynamic response of an oscillating ultrasonic file". Int Endod J 27 (1994): 197-207.
25. Lei S., et al. "Clinical characteristics and outcomes of patients undergoing surgeries during the incubation period of COVID-19 infection". EClinical Medicine 9 (2020): 1-8.
26. Chen N., et al. "Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study". Lancet 395 (2020): 507-13.
27. Day M. "Covid-19: Ibuprofen should not be used for managing symptoms, say doctors and scientists". Br Med J 368 (2020): 1086-8.
28. Powell CA, Mealey BL, Deas DE, McDonnell HT and Moritz AJ. "Post-surgical infections: Prevalence associated with various periodontal surgical procedures". J Periodontol 76 (2005): 329-33.
29. Slots J. "Herpesviruses in periodontal diseases". Periodontol 38 (2005): 33-62.
30. Colson P, Rolain JM and Raoult D. "Chloroquine for the 2019 novel coronavirus SARS-CoV-2". Int J Antimicrob Agents 55 (2020): 1-2.
31. Howorth F. "Air flow patterns in the operating theatre". Eng Med 9 (1980): 87-92.
32. Sawhney A, Venugopal S and Tripathi S. "Aerosols how dangerous they are in clinical practice". J Clin Diag Res 9 (2015): 52-7.
33. Guidelines for handling, treatment, and disposal of waste generated during treatment/diagnosis/quarantine of COVID-19 patients. New Delhi, Ministry of Environment, Climate and Forest Change (2020).
34. Harrel S and Molinari J. "Aerosols and splatter in dentistry". J Am Dent Assoc 135 (2004): 429-37.
35. Public service announcements: COVID 19. Centers for Disease Control (CDC) Division of Oral Health, National Center for Chronic Disease Prevention and Health Promotion.
36. Ayogi Y, Beck CR and Nguyen-Van-Tam JS. "Healthcare worker's willingness to work during an influenza pandemic: a systematic review and meta-analysis". Influenza Other Respir Viruses 9 (2015): 120-30.

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