Post COVID-19 protocol of treatment, radiologic examination and infection control in dentistry

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ABSTRACT

The COVID-19 is an utmost challenge to the health care profession. The medical professionals and system and has recommended different reaction and sorts of solutions found all over the world. As the dental health care professionals deal directly with the oral cavity, their responsibility in avoiding the spread of COVID-19 proves significant. All the usual dental treatment and procedures put on hold into countries which come across COVID-19. During this pandemic, there is a need for planned crucial care which might be delivered by dental professional and auxiliary they should be provided with proper PPE on priority. Dental health care professionals should also be trained to contribute to health care. Quick re-organization of significant health care support is not simple. Dental health care professionals have an ethical duty to lessen the fear of spreading COVID-19 for routine care in dental patients. But they were and are worried concerning the monetary issues. The huge data is online accessible and over societal media, but still, it is hard to recognize research confirmation and supervision; however, ethical conclusions should be made.

INTRODUCTION

COVID-19 is very much infectious and is speedily spreading all over the world. COVID-19 leads to severe acute respiratory syndrome (Stevens, 2020). Although the 2019 coronavirus is distinct from SARS-CoV, it has similar host receptor, ACE2 (human angiotensin-converting enzyme 2). SARS-CoV-2 was first showed in 2019 in Wuhan, China, spreading globally, which unfortunately resulted in the 2019–2020 pandemic, as declared by the WHO and the PHEIC (Public Health Emergency of International Concern). The infection initiated in Asia, but it has speedily spread across the world. As stated by WHO, this is the first pandemic caused by a coronavirus (Stevens, 2020).

The COVID 2019 outbreak was declared as the pandemic on 11 March 2020. In many countries, only emergency or minimal treatments are carried out, and they are completely stopped up in affected coun-
tries (Alharbi et al., 2020). However, several suffered countries are giving the usual dental care. During such a pandemic, there is ambiguity in ideal worldwide strategy regulating dental care (Alharbi et al., 2020). This vagueness of guidelines might increase the probability of nosocomial spread of COVID-19 through Dentist and auxiliaries, and there might be a delay in providing quick dental treatment. Furthermore, stopping dental treatment during such a phase will elevate the load on critical departments who are previously struggling because of the pandemic (Alharbi et al., 2020).

Dentistry in the global context

The COVID-19 spread is affecting countries, has posed a significant challenge to dental and medical institutions. All-around the world, the pace of response and kind of reaction to this disease has been exceptionally different stated by variable healthcare systems, economy and legislative ideologies (Wang et al., 2020).

The various measures to prevent the spread of COVID-19 integrated lockdowns and compulsory quarantines to an outstanding level. By assembling the location, data of mobile phone and use of biometric authentication technology for tracking of movements of people cannot readily be followed in other countries, and many would like to prioritize the right of an individual for finishing degree of surveillance. China gave an opinion all healthcare professionals to make use of personal protective equipment (PPE), equivalently to that earlier kept for mega infectious pathogens like cholera and plague. The regular dental care was also deferred in the first month of 2020 and 90 days later planned required to expected (Meng et al., 2020).

The initial view of the United Kingdom's National Health Services stated that the dentists and auxiliary should carry on providing accustomed care to patients having no symptoms of illness or disease with no history of adjacent contact with vulnerable people and too demoralized attending symptomatic patients (Mallineni et al., 2020). In the meantime, various dentists were awkward with this opinion and felt that their ethical duty is to decrease usual care because of the terror of spreading the COVID-19 to their patients and beyond (Wu et al., 2020). The general dental practitioners were also reasonably concerned as they were self-employed and were worried about their financial consequences (Wu et al., 2020). Although the public separation actions were initiated for the residents by the British government, the recommendation to carry on with usual dental care (Wu et al., 2020). In the United Kingdom along with other countries in Europe, were speedily past the ‘control phase’ with the fact that they could only delay the more multiplication of disease and mandatory to do so in a manner that is the best match their previously exhausted NHS capacity. Chinese analyst had quickly insulated this new virus and extract its genome to develop the tests to identify it (Wu et al., 2020).

In the United Kingdom, a national health system is at liberty at the point of providing only medical facilities, but not any dental care. The reforms over time have, however, resulted in a national system which is fragmented and bureaucratic. Therefore, the Dentist focused to the NHS for national enlightenment, at the same time in the regions of the United Kingdom because dental health care services are considered unique while doing this, they showed some discrepancies (Coulthard, 2020).

Dental treatment during the pandemic

In China, regardless of the extensive spread of COVID-19 in the duration of this epidemic, it is found that the demand for emergency dental care reduced by 38% the finding demonstrates that the community need emergency dental treatments during the pandemic will necessary (Guo et al., 2020). Till the date, since COVID-19 outbreak announced as a pandemic, still, numerous dental schools, University, authoritarian, consultative bodies lack specific insight regarding; universal consequences the pandemic on dental care services. Around the world various Dental associations their actions and responses, varied from recommending dentists to shut down their clinics in California, USA in the way to reduce the number of usual examinations in the UK; to no instruction from numerous dental universities extended in the world (Alharbi et al., 2020).

This kind of vagueness is expected because of the instability in the magnitude of COVID-19 pandemic within distinct countries and since the reality is that the prior pandemic was influenza around a century earlier. According to the US Government “COVID-19 response plan published by the US Department of Health and Human Services (HHS) on 13 March 2020, this COVID19 pandemic could last over 18 months”. Terminating dental practices at some stage in this pandemic can cut the quantity of attacked individuals; at the same time will increase the suffering of the persons requiring emergency dental care.

It will exasperate the burden on hospitals crisis wards. Hence there is a need for the formation of standard guidelines for the provision of dental health care during the universal outbreak of this pandemic (Mills et al., 2004).
Inventory checklist

Equipment

Taking into account the likelihood of a future increase in the number of cases of COVID-19 disease, the healthcare facilities must have a clear action plan to handle patients at surge capacity. Inventory Checklist for Personnel including Medical, nursing, and ancillary staff requirement at surge capacity include assignment of staff members responsible for the care of COVID-19 patients. Inventory checklist should contain Personal protective equipment (PPE). Ensure appropriate training, including the use of PPE among staff committed in the concern of contaminated patients. One has to plan for the employment of additional staff at short notice in case of non-availability of staff. An established mechanism for the training of prompt staff in case of an outbreak should be in process (Reddy et al., 2011).

Materials

The materials comprise hand hygiene material in stocks as well as personal protective equipment. The requirement of supplies of stock for the projected period should be calculated. For reusable materials, there should be the availability of a disinfection facility. There should be sufficient supply of disinfection agents efficient against coronaviruses, adequate supply bins for garbage for discarding the potentially infectious waste and the appropriate facility of service and repair defective equipment (Reddy et al., 2011).

Personal Protective Equipment (PPE)

Proper hygiene is already emphasized and demonstrated to all concern people that the alcohol-based hand sanitizer to be used or soap for washing must be practised with customary steps suggested by WHO (Reddy et al., 2011).

PPE is compulsory presently and would incorporate as given below

Goggles and/or face shield should be used, comfortably fitting goggles consists of a soft tissue seal, Triple layer surgical mask preferably N95; during dental procedures, the respirator is needed, FFP3 – Standard mask must be worn throughout treatment of COVID19 positive cases. Disposable coverall/gown with hood /waterproof lining, surgical gloves, have to be changed frequently. Coverall / gown outer maybe extemporize and need to be replaced after treating every patient. Shoe covers also need to be used (Reddy et al., 2011).

The centre suggests the sequence of putting on and removal of PPE for disease control and prevention. The recommended protocol of PPE for wearing and removal should be practised, and rooms for the same should be assigned and designated. As per standard infection control, after every dental procedure, the surgical mask should be changed, and all instruments used for that particular dental procedures should be disinfected, cleaned and sterilized (Reddy et al., 2011).

The necessary precautions are depicted below

Screening every patient is not exhibiting any symptoms of COVID19 meticulously considering every patient as a potential symptomless COVID-19 conveyer. Reviewing latterly improved patients are simultaneously probable carriers for at least 30 days after a laboratory test does the improvement and verification.

Recognizing the intense requirement of the patient and concentrating on governing it wherever slightest invasive procedures are done. Categorizing dental health care regimen as per the urgently required therapy, the risk and benefit linked with therapy. Recognizing the essential dental treatment required for each patient and the probabilities and advantages correlated with that treatment plan. Using exposure precautions incorporating proper aerosol-generating procedures and PPE for every procedure (Alharbi et al., 2020).

Categorization of Treatment

Critical control of fatal conditions includes the following

Give priority to unstable maxillofacial fractures compromising the airway. Diffused soft-tissue bacterial infection involving oral cavity and extraoral swelling; that can compromise the respiratory tract, and postoperative uncontrolled bleeding should be considered for emergency management (Alharbi et al., 2020).

Urgent situation handled with only invasive methods and without generation of aerosol

Acute dental pain from inflammation of pulp requiring tooth extraction, severe pain due to broken tooth that can be survived in the absence of generation of aerosol are to be done. Dental trauma with avulsion/luxation managed without generation of aerosol. Postoperative osteitis or dry socket can be managed without generation of aerosol. Pericoronal flap or impacted third molar pain can be managed in the absence of generation of aerosol. Stable maxillofacial fractures are requiring no intervention, localized dental abscess can be managed without generation of aerosol. Fixed orthodontic appliance leading to soft tissue laceration shall be
avoided (Alharbi et al., 2020).

**Urgent situation handled with invading and aerosol producing procedures**

Severe dental pain from inflammation of pulp can be managed with the generation of aerosol. Acute dental pain from a broken tooth that can be saved in the absence of aerosol-generating procedures can be done. Dental trauma with avulsion/luxation needing invasive/aerosol generating procedures can be done. Fixed and temporary prosthesis cleaning and cementation can be done. Adjustments of removable dentures for radiation/oncology patients, prosthesis causing soft tissue injury can be done. Acute periodontal disease can be done (Alharbi et al., 2020).

**Non-urgent procedures**

Adjustments or repairs of Removable dentures fractured or defective but asymptomatic restoration can be prolonged. Fractured or defective but asymptomatic fixed prosthesis corrections can be postponed. Fractured or defective but an asymptomatic orthodontic appliance. Chronic periodontal disease treatment can be postponed (Alharbi et al., 2020).

**Elective procedures**

Initial oral examinations or periodic and recall visits. The aesthetic dental procedure, restorative treatments of asymptomatic teeth can be prolonged. Extraction of asymptomatic teeth, orthodontic dental treatment is other than urgent situation handled with invading and/or aerosol producing procedures and non-urgent procedures can be postponed. Routine dental treatment and preventive therapies. Substitution of missing natural teeth with a fixed or removable prosthesis and dental implant surgery can be prolonged (Alharbi et al., 2020).

**Management considerations:**

Use of 23% povidone-iodine mouthwash is recommended for 15 seconds before the procedure. This step can decrease the viral burden in the saliva of the patient (Eggers et al., 2018). Whenever possible, disposable as well as one-use instruments and devices shall be utilized to reduce the risk, to reduce the spread of microorganisms and cross-infection, the use of a rubber dam is recommended. Moreover, the dental procedure shall be as minimally invasive as possible. Whenever possible, the aerosol-generating procedures should be avoided. When medicinal management of pain is required, the use of Ibuprofen must be avoided in confirmed and suspected COVID-19 cases (Cochran et al., 1989).

**Radiographic considerations**

There is a high degree of variation globally for the taking the radiographs of the patients who are suspected or confirmed COVID-19 due to local resources, socio-cultural approaches to imaging and the guidelines of individual learned bodies that are published (Simpson et al., 2020). Intraoral imaging must be avoided as far as possible. Instead, they use of extraoral radiographs is encouraged to minimize the gag reflex and the excessive salivation associated with intraoral radiographs (Nair et al., 2020; Kiamanesh et al., 2020).

The “use of CT as a primary screening tool is discouraged because these studies tend to suffer from selection bias” (Raptis et al., 2020; Fang et al., 2020). A recent (April 2020) meta-analysis reported sensitivity and specificity of 94% and 37% respectively (Rubin et al., 2020). In countries with a low prevalence (<10%), “the positive predictive value of RT-PCR was 10x that of CT chest” (Fang et al., 2020).

According to a “Fleischner Society consensus statement published on 7 April 2020”, imaging examinations is not advisable in suspected COVID-19 cases and patients with minimal clinical features unless they are prone for landing up into the disease (Rubin et al., 2020). Imaging may be indicated in a COVID-19 sufferer and in whom there is worsening of respiratory status but in a set up with adequate availability of resources (Rubin et al., 2020). For medical triage of suspected COVID-19 cases presenting with moderate to severe clinical presentations with a high chance of landing up into the disease, the imaging examinations can be carried out (Fang et al., 2020). Exhaustion of resources, especially PPE, may take place because of too much usage. In the radiology department, as COVID-19 positive and negative cases usually come into proximity, imaging examinations have the accentuated risk of spread to personnel, patients as well as their caretakers.

**Infection precautions during the radiologic investigation**

The clear infection control guidelines are vital as the personnel in a medical and dental imaging department are frequently in the forefront while treating the patients with COVID-19. The precautions for protecting from the aerosol are required for managing COVID-19 cases. Personal protective devices in the form of gown, N95 mask, gloves, and eye protection for aerosol-generating procedures are required (World Health Organization, 2020).

To limit transporting patients, patients requiring general radiography shall receive it with a portable machine or in dedicated auxiliary units. However, the patients requiring transport should be carefully shifted to and from the unit. All the machines, including any ancillary types of equipment, should
be wiped off with suitable disinfectant after each examination (Kooraki et al., 2020), to minimize cross-contamination, it is recommended to have two radiographers in attendance and one for cleaning and another one in contact with the patient’s system (Rodrigues et al., 2020). This is especially important in case of delay in presentations of oral malignancy cases, maybe because of low socioeconomic status and difficulty in access to cancer centre (Lohe et al., 2017). The organism, like SARS-CoV-2, can remain live for up to 72 hours on areas coming in the contact of an infected patient, which further reinforces the fortification of equipment from the virus. This can be accomplished with the help of sleeves as well as thorough clean-up of equipment after treating each patient (van Doremalen et al., 2020). The literature shows that the window glass of the patient’s room can be utilized to use the portable chest x-rays to reduce exposure of staff and to decrease the number of PPE required (Mossa-Basha et al., 2020), although departmental protocols may vary significantly. However, the radiographic examination shall be advised to only when the clinician thinks that the radiograph advised can provide valuable information that can affect the treatment plan (Sune et al., 2017).

**Infection control and biomedical Waste management**

Biomedical Waste Management of waste that is suspected especially in ICU or known to contain or be contaminated with COVID-19 does not necessitate special precautions beyond those previously used to protect personnel from the hazards which they might encounter during their routine job in the form of solid waste and wastewater management. The disposal of all waste material should be carried out as per the guidelines given by national accreditation of hospital (Malhotra et al., 2020).

**CONCLUSION**

The coronavirus disease encountered in 2019 is the greatest challenge which has been there for all health professions and their team. So, one must know the impacts of COVID-19 on dentistry and necessary actions thereof. It is found that the Dental health care professionals are at increased risk but equally play an important role in reducing transmission. First and the foremost important thing is to remain positive and proactive. Take into consideration the dentistry in a global context. Give attention to the care to be taken while delivering dental treatment during a pandemic. Keep the inventory of equipment and material, and one has to pay caution with prescribing NSAIDs.

**Funding Support**

The authors declare that they have no funding support for this study.

**Conflict of Interest**

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

**REFERENCES**


