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The COVID-19 Pandemic: Role of dental professionals in a tertiary care hospital setting

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Highlights

- A pandemic requires an "all hands-on deck" approach. Dental professionals with their skill set and knowledge present a less explored resource to answer the COVID-19 pandemic.
- Optional medical work and specific training for pandemic relief should be incorporated into dental curriculum to train students, improve their knowledge and skills in future pandemics.
- This article describes the experience of dental professionals as front line workers in a tertiary care hospital designated as a dedicated COVID–19 facility.

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Abstract

The coronavirus disease which originated in Wuhan, China led to a worldwide pandemic. In India, which harbors the second largest population in the world, it created challenges on multiple fronts. In view of the increasing demand for medical healthcare, dental professionals represent an untapped resource to combat the pandemic. In many countries, dental professionals have risen to the challenge in the fight against COVID-19. This review aims to highlight the experience of dental professionals in a tertiary care hospital designated as a dedicated COVID–19 facility as frontline workers while also providing a perspective on the much larger role a dental professional can play in future pandemics.

Keywords: Coronavirus; Dentistry; Pandemic

INTRODUCTION

The highly infectious novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), ravaged the globe from its inception in Wuhan, China. An exponential rise in cases severely challenged the healthcare system sending it on the verge of collapse on many occasions.[1] In India, the virus effectuated devastating consequences in the form of increased mortality and shortage of essential medical services.[2] In a developing country, such as India, the medical facilities were overwhelmed by the immensity of the outbreak, and hence, the personnel from all healthcare disciplines were required to comply with the 'all hands-on deck' approach. Despite the varied experience, dental professionals with their skill set and knowledge present a less-explored resource to address the coronavirus disease-19 (COVID-19) pandemic. Trained in surgical techniques and basic life support, dental professionals have proven to be an asset in combat with the pandemic.[3] This review aimed to highlight the putative role of a dental professional in future pandemics.

Role of a frontline worker in a COVID-19 dedicated tertiary care level hospital

With the reconfiguration of the force, the dental professionals in the tertiary care hospitals in Delhi National Capital Region played myriad roles in the pandemic with respect to administrative duties, running of the 'control centre', being part of the teams in the Inpatient Department and dental and medical emergency services, and active participation in the management of mucormycosis cases during the second wave of COVID-19 in India.

Management of dental emergencies during the COVID-19 pandemic

During the pandemic, access to routine or emergency dental care has been limited, increasing the number of individuals suffering from unmet care.[4] A study by Li et al.[5] investigated the oral health status in Wuhan and concluded that 44.2% of school-age children suffered pain or discomfort related to teeth and gums during the epidemic. Furthermore, the fear of contracting the virus reduced the dental attendance despite the increasing need for healthcare.

The dental complaints of COVID-19-positive and suspected patients were managed by the dental professionals during the outbreak after appropriate triage and screening based on the oral health guidelines published for safe dental practice.[6] The treatment plan underwent modifications according to the severity of the COVID-19 pandemic, including the suspension of non-emergency dental care services at the peak of the COVID-19 outbreak and relaxing the restrictions when the pandemic was under control. However, according to the national guidelines[6], the emergency management for suspected and positive patients was undertaken with level 3 personal protective equipment and standard COVID-19 protocol. Patients with acute emergencies presenting various oral conditions, including space infections, acute apical abscesses, acute pulpitis and dry sockets, were managed during the outbreak (Figure 1a).

Most COVID-19 patients had visited other hospitals for dental complaints but had been turned down due to being positive. The details of the demographics and medical and dental history were recorded via telecommunication. In cases requiring physical examination, a visit to the segregated ward for COVID-19-positive patients was allowed under personal protective equipment (Figure 1b).[7] The management of acute oral conditions/problems during the pandemic requires a modified approach that focuses on the triage of the patient, followed by an appropriate treatment plan.[8] According to the recommendations, the management of dental emergencies in a COVID-19 positive patient

includes treatment by analgesics and antibiotics (swelling/systemic infection) and self-help advice, including chlorhexidine mouthwash/gel or warm salt water mouthwash and gentle toothbrushing of the affected area with a small head toothbrushing combination with benzydamine mouthwash.[8,9,10,11] Moreover, urgent care by extraction or drainage is advocated for cases spreading infection without airway compromise or recurrent symptoms, whereas emergency care is instituted in the event of infection spreading due to an airway compromise or trismus.[10,11] It is also advisable to refer the patient to a designated urgent dental care centre in case of severe or uncontrolled symptoms with adequate documentation.[10,11] Patients who were managed for emergency conditions were followed up with telecommunication, and elective, interventional treatment was carried out for them after full recovery following the standard COVID-19 protocol.

Management of mucormycosis during the COVID-19 pandemic

A second blow was in the form of rising cases of mucormycosis, a fatal disease following the pandemic that had already overstretched the health services. Several cases of mucormycosis in patients with previous COVID-19 infections were reported worldwide, with the highest number of cases in India.[12] Moreover, mucormycosis is an uncommon fungal infection, frequently observed in patients with previous COVID-19 infection and a history of poorly controlled diabetes mellitus and unwarranted use of steroids.[13] The oral manifestations of Mucormycosis involve ulceration of the palate that require surgical intervention, followed by prosthetic rehabilitation of the hard and soft tissues.[14] Rhinocerebral mucormycosis is the most common variety of the disease that is manifested as headache, sinus congestion, one side facial swelling, visual disturbances, black lesions on the nasal turbinate and palate, gingival or periodontal abscess, fever and black pus drainage.[12] While surgical management entails the extensive removal of the infected tissue, it also leads to scarring and altered functioning. Prosthetic rehabilitation is opted over surgical reconstruction because of the inherent advantages.[15,16] Furthermore, an obturator is recommended as it improves the patients' quality of life, with emphasis on phonetics and deglutition and safeguards the tissue for complete healing.[17] In collaboration with the medical (infectious disease, neurology and critical care) and surgical (otorhinolaryngology, ophthalmology and neurosurgery) wings, the dental team was able to provide a multidisciplinary approach to improve the survival outcomes of patients admitted with rhinocerebral mucormycosis. Treatment was facilitated by covering the dental referrals, obtaining bedside impressions of the palatal defects and providing customised temporary obturators for patients who had undergone surgical treatment. A large number of patients were recommended post-surgical management with defects ranging from minor intraoral to major midfacial, and such patients were provided temporary prosthetic rehabilitation (Figure 1c).

Role of teledentistry

During the pandemic, the dentistry specialty had come to a halt because dentists were very likely to acquire the infection. Nevertheless, care for the old and new patients was continued via teledentistry, wherein consultations were carried out using telecommunication and online platforms, information and images were exchanged, and appropriate, reliable advice and treatment were given in a timely fashion.The speculation that the virus may become endemic has led to the reorganisation of dental setups and the introduction of innovative strategies to provide efficient healthcare while limiting direct contact and cross-infection.[18] Teledentistry offers

manifold applications with various subunits, such as teleconsultation, telediagnosis, teletriage and telemonitoring.[19] A study conducted by Bavaresco et al.[20] revealed a reduction of >45% in the number of referrals from primary health centres to higher centres by teleconsultation.

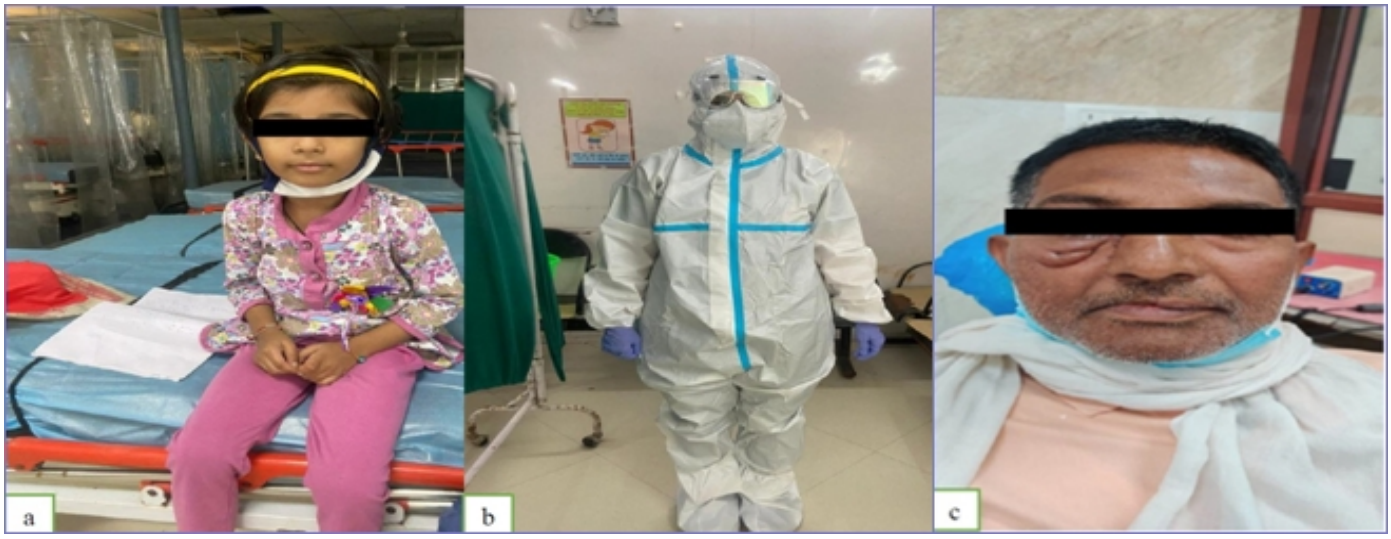

Figure 1. a: Emergency management of a COVID–19 positive, 5-year-old child patient; b: Personal protective equipment worn for COVID–19; c: Management of Mucormycosis in patients of previous COVID–19 infection

Programs such as EstomatoNet[21] and Mobile Mouth Screening Anywhere (MeMoSA®)[22] were developed to facilitate diagnosis for individuals with limited access to healthcare. However, telediagnosis was further expanded to detect and provide a differential diagnosis for oral lesions during the pandemic, as described by Machado et al. in 2020.[23] A pilot study conducted by Giudice et al.[24] addressed concern of employing telemedicine for monitoring patients during the COVID-19 pandemic. Telemedicine allowed monitoring of all patients while reducing the costs and decreasing the risk of viral transmission.

Although teledentistry has its limitations, it is a useful tool and therefore should be made a mainstay of the dental practice to continue providing healthcare during and beyond a pandemic.[19] A nationwide comparative analysis[25] among dental professionals showed high awareness regarding teledentistry in general dentists, and a majority of them agreed that it improved healthcare (88.20%) and increased access to rural areas (82.90%).

Administrative management

The Control Centre, termed by the administrative authorities, was a network between the Wards and the Emergency Services. Managed by the dental students, the Centre acted as a conduit for the smooth transfer of patients when hospital beds were scarce and panic was rising. The Control Centre also provided services to the attendants of the admitted patients to assimilate the knowledge of the patient status and current management.

Role in triage and inpatient department

Several dental professionals also worked in close proximity to the doctors in the Emergency Services and the Wards, providing assistance and care along with the necessary task of triage. The professionals also helped in continuous monitoring of the patients, taking nasopharyngeal and oropharyngeal swabs for COVID-19 testing and providing oxygen support. Triage segregates patients based on the severity of symptoms and is a crucial facet of the clinical decision-making thiat has an impact on the outcome of severely ill

patients. Under normal circumstances, a dental professional is unlikely to be a part of the medical triage. However, in these unprecedented times, the dental postgraduate students comprised the team that worked in triage under the close supervision of the critical medicine specialists.The responsibilities of the dental professional in the triage ranged from primary assessment of the patient and evaluation of the vitals to assisting in stabilisation and resuscitation, followed byeventual transfer depending on the specific medical requirements of the patient.

Looking forward–future perspectives

Several studies[26] provided evidence on the new mutant strains of SARS-CoV-2 and their increasing pathogenicity. Therefore, there is an increased likelihood of future outbreaks for which the country and its healthcare system must be prepared. Dental students are trained in many of the same subjects as their medical counterparts, and hence are well-placed to assist and aid in medical settings, but they lack practical exposure.[3] A study conducted in Nigeria[27] showed that dental students have a positive response and consider it as an educational experience to being involved in the COVID-19 pandemic. The students were willing to volunteer if they were adequately trained to improve their knowledge, skills and preparedness. Including optional medical work and specific training for pandemic relief in the teaching curriculum may allow the students to contribute significantly during a crisis. Regular courses and retraining in basic life support, medical emergencies and infection control should be conducted.[3] The cascade suggested many plausible ways in which a dentist can work beyond dentistry in a pandemic, such as COVID-19 (Figure 2).

CONCLUSIONS

Threats such as COVID-19 pandemic affect every aspect of a society's way of functioning while providing a pathway for improvement. Nonetheless, there is a constant need to evolve and upgrade our current understanding of the best way to manage a crisis situation. The utilisation of the existing resources in an efficient method is crucial in a developing country. Dental professionals present a cost-effective resource that can be advantageous over a reduced workforce. With adequate training and exposure, dental professionals are well-equipped to play a significant role in the COVID-19 pandemic and are also prepared for any future global crisis.

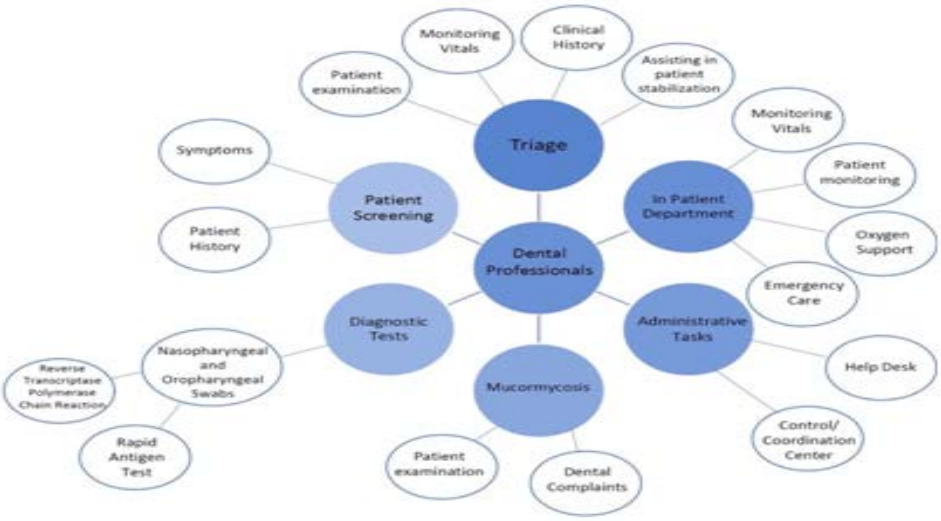

Figure 2. How a dental professional can contribute beyond dentistry in a pandemic like COVID-19

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