



PROSTHODONTICS IN THE REALM OF THE PANDEMIC

**Mitha M Shetty., Archana K Sanketh*, Kalavathy N., Roshan Kumar.,
Anuradha Venkataramani and Roopa M**

Department of Prosthodontics DAPMRV Dental College, JP Nagar I Phase, Bangalore.

A R T I C L E I N F O

Article History:

Received 4th June, 2021

Received in revised form 25th

July, 2021

Accepted 23rd August, 2021

Published online 28th September, 2021

A B S T R A C T

Dental health care has undergone a dynamic transformation due to the current covid 19 pandemic. New regulations and treatment protocols have emerged, due to which there has been plenty of upheaval in the present practice of dentistry. Unfortunately there is a deficiency of evidence based recommendations on what is right and what is not. This paper has intended to discuss certain aspects of change in the specialty of prosthodontics due to the pandemic.

Key words:

Pandemic, change, prosthodontics, protocols

Copyright©2021 Mitha M Shetty et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

The novel human corona virus, SARS-CoV-2 is the microorganism that is responsible for the current COVID 19 pandemic. Though the COVID 19 is a global concern, there is a special apprehension with regards to the dental specialty, because of the close proximity to the face.

The various modes of cross contamination with the SARS-COV 2 could be through inhalation of the virus via droplets and aerosols, direct or indirect contact through contaminated instruments, all of which are in abundance in the world of dentistry.

The Dental Council of India (DCI) issued a set of advisory in March 2020 that includes the necessary preventive measures to keep the pandemic at bay¹. This has been updated subsequently.

In spite of this, dentists, especially prosthodontists are at an increased risk of contracting and transmitting COVID 19 and other communicable diseases. There is an increased threat of exposure to a prosthodontist due to various factors such as aerosol generation during tooth preparation, salivary contamination during impression procedures for fixed or removable prosthesis, exposure to blood during implant procedures, extended procedure time, multiple visits, etc. Another factor of concern is the amount of geriatric care provided by prosthodontists².

Infection control protocols have to be stringently followed and should be considered a gold standard to keep patients, dentists and staff safe.

***Corresponding author: Archana K Sanketh**

Department of Prosthodontics DAPMRV Dental College, JP Nagar I Phase, Bangalore.

Organisms commonly involved in infection spread are hepatitis B virus, mycobacterium tuberculosis, herpes simplex virus, hepatitis C virus, mumps, rubella, influenza, cytomegalovirus, and human immunodeficiency virus³.

The aim of this paper is to elaborate on certain aspects of post covid changes, some of which have been implemented and some of which still need to see the light of day.

Method of data collection

Electronic databases were the source of information with the following search terms: Covid 19, infection control, cross contamination, pandemic, prosthodontics, tele dentistry, etc. Guidelines from regulatory bodies such as World Health Organization, Centers for Disease Control and Prevention (CDC), Dental Council of India were also referred.

RESULTS

Most available articles were narrative reviews and small descriptive studies, probably due to the ever changing information of the covid 19 virus and the spread of disease.

DISCUSSION

The covid 19 pandemic has spread its unrelenting roots all over the world. The ease of transmissibility in dental clinical practice has created extensive concerns among dental personnel and patients likewise.

Dental emergencies under the purview of Prosthodontics may not be applicable in the strict sense of the word. However there

are certain urgent situations that a prosthodontist needs to attend to in the ongoing pandemic. Trauma due to denture fracture, need for repair of broken dentures, crown/bridge repair or cementation, problems with implants or implant prosthesis, ulceration due to sharp edges of tooth or prosthesis, etc to name a few prosthodontic procedures that warrant immediate treatment by the prosthodontist. Also in the course of the pandemic with the waxing and waning of the disease, clinicians and students have started performing elective prosthodontic procedures as well.

Academic impact

Dental students, in this pandemic are in a situation that is unlike other health care professionals, because of the increased risk of cross infection and working in close proximity to the oral and nasal cavities. Psychological stress and depression has been reported in clinicians and dental students, mainly due to fear of contracting the covid infection, financial liabilities, etc⁴.

The clinical exposure and skills of UG/PG students in the specialty of prosthodontics have been affected without doubt. The pandemic had created a significant impact on the learning process, due to the need for maintaining social distancing and following online teaching methodology.

The preclinical training that is a must to develop cognitive and manual skills has been put on hold. Virtual platforms cannot be a substitute for direct patient interaction⁵. Students have also been deprived of attending academic conferences, graduating ceremonies, cultural programs and competitions at the institution and inter college level⁴.

On campus teaching and student-faculty interactions have taken a blow. Though not a true substitute, various online platforms have come to the aid of students, clinicians and academicians

The internet in these trying times has definitely been a boon in the field of dentistry, be it for attending virtual conferences/webinars, video demonstrations, patient consultations, etc.

The pandemic has also brought about a huge change in the examination system, especially for post graduates. The online system of examination may not entirely do justice, but little is in the hands of the administrative body, keeping in mind the safety of all people involved.

Studies have shown that majority of dental schools across the world have implemented online pedagogical methods with limited clinical activity, in lieu of the pandemic⁶.

Our very own institution, as many others are following e-learning strategies, but this methodology cannot be a success with all sub specialities, especially those that have patient centered learning⁵.

There may have been certain possible gains in this pandemic that include increased online surveys and research, knowledge about various virtual technologies, increasing peer group interactions through online group discussions, popularity of tele consultation and of course better family bonding⁴.

Also when compared to traditional teaching methods, the scientific material can be frequently and effortlessly updated and easily accessed. Another advantage is that it can easily nurture self-learning skills⁵.

It is of utmost importance to keep student deficiencies and apprehensions in mind when making new protocols in this pandemic. Studies have shown that the pandemic has created a negative psychological impact on dental students, causing fear, anxiety, lack of confidence, etc⁷. Hence it becomes a necessity that dental institutions provide sufficient knowledge about the covid 19, precautions to be followed, details of the vaccines available and new protocols to be implemented to all its students to help them cope up better in the pandemic.

It is essential to bear in mind that virtual teaching learning methodologies cannot be consistent due to financial constraints (internet packages, data usage, laptops, etc), differences in the quality of technology being used by faculty and students, to mention a few⁸.

Also lack of adequate expertise (in the field of software, hardware, etc being used) can be a major deterrent in this virtual world., Hence relevant training sessions may need to be conducted for students and faculty⁸.

Treatment protocols may need to be upgraded, due to the behavior of the virus. Hence a continuous update of the practices to be followed is of paramount importance to keep cross infection to a minimum. Thus health care professionals, be it students, academicians or clinicians will be faced with visible and invisible challenges in the forthcoming future. Also it is the most practical thing to keep up to date with the evolving online technologies and be resilient, in order to come out victorious.

Tele dentistry

Tele dentistry is a combination of telecommunications and dentistry, involving the exchange of clinical information and images over remote distances for dental consultation and treatment planning⁹.

Tele dentistry has been a godsend in the current pandemic. Dental patients have no reason to feel abandoned as most clinicians are practicing tele dentistry along with tele diagnosis and tele triage. The widespread use of smart phones has enabled patients to share relevant images, thus enabling a diagnosis and thereby treatment¹⁰.

However on the downside of tele dentistry, dental students and clinicians need to be adequately trained to conduct various aspects of tele dentistry with confidence and ease. Also, patient acceptance of tele dentistry is the vital to its success. Currently patients still find comfort in a personal interaction with the doctor/dentist. This aspect of patient apprehension can be allayed to a significant extent through video consultations.

Another important and interesting facet of tele consultation could involve dentists and medical specialties, thus facilitating diagnosis and treatment plan of complicated cases⁹.

Infrastructural changes

Important among the many post-covid changes are the infrastructure changes in the clinical set up. The set-up of isolated operator or cubicles has become mandatory, especially for aerosol generating procedures. All operatories need to have adequate high volume suction and ventilation. Proper disinfection protocols must be followed in between patients. Designated donning and doffing areas for PPEs must be identified and made available. Separate entry and exit for

faculty/clinician and patients should be made available, so that exposure is kept to a minimum¹¹.

The feasibility of carrying out infrastructure changes depends on area available, number of health care workers and number of patients visiting a particular dental set up, be it a hospital or a private set up¹².

Changes in the covid and post covid times have evoked a mixed response from practitioners, support staff, students and patients. There have been increased costs with respect to infrastructural changes, PPEs and thus treatment charges. Additional training in all aspects of change, keeping in mind various faculties involved can be a challenge. Comfort aspects and physical difficulties working with the PPE also need to be kept in mind and addressed. Last but not the least the pandemic has impacted us mentally to varying extents, for which counseling and remedial measures must be put in place.¹³

Patient Appointment scheduling

In continuation with the previously followed patient scheduling, certain additional aspects need our attention, some of which are mentioned below¹⁴:

- Monitoring of the patients temperature and oxygen saturation levels are a pre requisite before entry into the hospital/practice.
- Patients to be instructed to maintain the time slot given to them.
- Appointments need to be spaced apart, so that there is no crowding in the waiting area
- Attendants allowed only if the patient is unable to manage on his/her own
- The number of appointments can be kept to a minimum on any given day by following tele consultation protocols.

Patient instructions

All patients entering the dental hospital/clinic should have a mask on and must maintain physical distance. Patients to be provided with personal protective equipment (PPE) and should be clearly instructed regarding the doffing off the PPEs at the designated areas prior to leaving the dental office. Proper patient education will definitely help in maximizing their co-operation in the COVID pandemic.

Clinician Protection¹⁵

It is a mandatory protocol to use N95 masks, when aerosol generating procedures are being performed, for the simple reason that the N95 mask prevents the inhalation of 0.3 µm particles by 95%. It is always preferable to use disposable gowns over the fabric gowns, so that they can be changed for every patient and the underlying gown does not get contaminated.

Sterilization and disinfection protocols¹⁴

- Hand sanitizers with a foot pedal need to be placed at strategic areas right from the entrance through the reception, waiting area, treatment area, donning and doffing areas.
- A high volume suction is to be used compulsorily for all aerosol generating procedures.

- A pre procedural mouth rinse with either chlorhexidine or betadine has shown promise in containing the covid 19 virus, though some clinicians find this debatable^{15, 16, 17}.

The nosocomial spread of the covid 19 can be prevented by diligently following specific protocols mentioned above along with the standard sterilization and disinfection protocols routinely practiced.

Waste Management

Waste disposal is often an ignored but very important aspect in the health industry. Dental health care generates large quantities of waste, which needs to be segregated appropriately in order to maintain the safety of the clinician and patient¹⁸. It is rightly said that the 'waste of the sick should not contaminate the lives of the healthy'.

Digital workflow

Computer-aided designing and computer-aided manufacturing (CAD/CAM) technology has become very popular among clinicians and technicians. A significant reduction in cost and working time is seen and also minimizes the number of steps when compared to the conventional workflow.^{19, 20, 21, 22} Digital intervention is especially noteworthy in the current pandemic as it reduces the risk of infection due to the decreased contact among various dental personnel and the patient¹⁹.

What we don't have answers for yet?

Dental institutions and universities are forced to enforce measures to continue the process of dental education. There is no need to reinforce the fact that virtual teaching can never be at par with actual patient experience. So are the students equipped to face the future keeping in mind the limited clinical and pre clinical skills? Is there a need to increase the duration of the UG/PG courses in order to help them overcome the shortfalls? Is there a need to make permanent infrastructure changes? Time is the only answer to these questions.

Future concerns

Repeated lockdown, physical distancing, quarantine protocols in the current lockdown have a definite impact on the mental and physical health of patients.²³ Mental health disorders, cardiovascular events, diabetes mellitus, etc may be on the rise either directly or indirectly because of the COVID 19 pandemic. This in turn may result in implications with respect to patients' diagnosis, treatment planning and prognosis^{23, 24}.

CONCLUSION

Prosthodontists are at a constant risk of getting exposed to the covid 19 virus, through patient contact, performing aerosol generating procedures, cross infection from the dental laboratory, etc. It is of significance to remember that a single approach or protocol cannot reduce the risk of infection to dental personnel and patients wholly¹⁶.

Hence it is of extreme importance that a proper triage is followed while keeping in mind the various required protocols and containment measures, in order to keep safe in the current pandemic. It is also vital that the dental fraternity, be it clinicians, academicians, students or support staff, be mentally, psychologically and physically well prepared to take the COVID 19 pandemic head on and emerge victorious.

References

1. Dental Council of India-Precautionary and Preventive Measures to Prevent Spread of Novel Coronavirus (COVID-19). Available online: https://dciindia.gov.in/Admin/NewsArchives/L.No._8855.PDF
2. ZeynepYesilDuymus and ReemAbdulrahim. How Can We Handle Pandemic in the Dentistry and Prosthetic Clinic? Recommendations and New Approaches. On J Dent & Oral Health. 4(3): 2021.
3. Ahmed M A. *et al.* Evaluation of Patient's Knowledge, Attitude, and Practice of Cross-Infection Control in Dentistry during COVID-19 Pandemic. Eur J Dent. 2020 Dec; 14(Suppl 1): S1-S6.
4. Alzahrani S B *et al.* Impact of COVID-19 on dental education, International Journal of Health Sciences and Research, Vol.10; Issue: 6; June 2020.
5. Hattar S *et al.* Impact of COVID-19 pandemic on dental education: online experience and practice expectations among dental students at the University of Jordan. BMC Medical Education (2021) 21:151
6. Quinn B, Field J, Gorter R, Akota I, Manzanares MC, Paganelli C, *et al.* COVID-19:the immediate response of european academic dental institutions and future implications for dental education. Eur J Dent Educ. 2020; 2020:11.
7. Atas O, TaloYildirim T. 2020. Evaluation of knowledge, attitudes, and clinical education of dental students about COVID-19 pandemic. PeerJ 8:e9575 <http://doi.org/10.7717/peerj.9575>
8. Alkadi L. Dental Education in the COVID-19 Era: Challenges, Solutions and Opportunities. The Open Dentistry Journal, 2021, Volume 15, pp 17-24.
9. Deshpande S, *et al.* International Journal of Telemedicine and Applications, Volume 2021, Article ID 8859746, 6 pages.
10. Ghai S. Teledentistry during COVID-19 pandemic. Diabetes & Metabolic Syndrome: Clinical Research & Reviews 14 (2020) 933-935.
11. Watfa M O *et al.* Rapid implementation of teledentistry during the Covid-19 lockdown. Advances in Oral and Maxillofacial Surgery 2 (2021) 100031.
12. Sa *et al.* Coronavirus disease 2019 (COVID-19): Experiences and protocols from the Department of Prosthodontics at the Wuhan University. The Journal of Prosthetic Dentistry, 2020, Volume 126, Issue 1, pp. 41-50.
13. Pruthi G. *et al.* Comprehensive review of guidelines to practice prosthodontic and implant procedures during COVID-19 pandemic. Journal of Oral Biology and Craniofacial Research 10 (2020) 768-775.
14. Kalenderian E. *et al.* COVID-19 and dentistry: Challenges and opportunities for providing safe care. August 2021, URL: <https://psnet.ahrq.gov/primer/covid-19-and-dentistry-challenges-and-opportunities-providing-safe-care>
15. Batista A U D. *et al.* Prosthodontic practice during the COVID-19 pandemic: prevention and implications. Braz. Oral Res. 2021; 35:e049.
16. Kamate S K. *et al.*(2020). Assessing Knowledge, Attitudes and Practices of dental practitioners regarding the COVID-19 pandemic: A multinational study. Dent Med Probl 57(1): 11-17.
17. Sekhsaria *et al.* IP Annals of Prosthodontics and Restorative Dentistry 2020; 6(2):71-76.
18. Saha M K and Wadhvani T. Pandemic & prosthodontics. Int J Appl Dent Sci 2020; 6(3):508-512.
19. Papi P. *et al.* Digital prosthetic workflow during COVID-19 pandemic to limit infection risk in dental practice. Oral Dis. 2020; 00:1-4.
20. Chochlidakis, K. M.*et al.*2016. Digital versus conventional impressions for fixed prosthodontics: A systematic review and meta-analysis. Journal of Prosthetic Dentistry, 116, 184-190.
21. Joda, T. *et al.* 2000. Digital technology in fixed implant prosthodontics. Periodontology,73, 178-192.
22. Duymus Z Y and Abdulrahim R. How Can We Handle Pandemic in the Dentistry and Prosthetic Clinic? Recommendations and New Approaches. On J Dent & Oral Health. 4(3): 2021
23. Varghese B and Sundaram RK. COVID-19 and prosthodontic practice: a review. International Journal of Contemporary Medical Research 2021; 8(1):A9-A13.
24. Ozili P and Arun T. Spillover of covid-19: impact on the global economy.https://mpra.ub.uni-muenchen.de/99850/1/MPRA_paper_99850.pdf
25. Centers for disease control and prevention. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html> (Last Updated Dec. 4, 2020)

How to cite this article:

Mitha M Shetty *et al* (2021) ' Prosthodontics in The Realm of the Pandemic', *International Journal of Current Advanced Research*, 10(9), pp. 25110-25113. DOI: <http://dx.doi.org/10.24327/ijcar.2021.25113.5011>
