COVID 19 AND ITS IMPACT OF DENTAL IMPLANTS CASES: SYSTEMATIC REVIEW

Dr. Bushra Kanwal1, Dr. Suhani Jayadev2, Dr. Doddly Lokanathan Balaji3, Dr. Vineet Khinda4, Dr. Anas Abdul Khader5, Dr. K. Pratyusha Lakshmi6, Dr. Sirisha Kommuri7.

1Specialist Orthodontist, Rawaa Almas Splendid Diamond clinic, Al Baha, Saudi Arabia. drbushrakanwal4@gmail.com (Corresponding Author)
2Dental Assistant, City San Diego, State California. suhanijayadev@gmail.com
3Senior lecturer, Department of prosthodontics, Priyadarshini dental college and hospital, Thiruvalur, Tamil Nadu. lokanathan.balaji@gmail.com
4Lecturer, Pediatric Dentistry, College of Dentistry, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Kingdom of Saudi Arabia. khindav@ksau-hs.edu.sa
5Assistant Professor, Department of Preventive Dentistry, College of Dentistry in ArRass, Qassim University, Kingdom of Saudi Arabia. an.muhammed@qu.edu.sa
6Reader, Department of Prosthodontics and Crown & Bridge, SVS Institute of Dental Sciences, Mahbubnagar, Telangana. pratyushakoganti@gmail.com
7PhD Scholar, Department of Prosthodontics, Narisinhbhai Patel Dental College and Hospital, Sankalchand Patel University, Visnagar, Gujarat, 384315. k.siri88@gmail.com

ABSTRACT

The year 2020 will always be remembered as the year of COVID-19. It influenced almost every facet of our society – and medical and dental services in particular. The pandemic caused by the SARS-CoV-2 virus led to a near-worldwide lockdown. This has had a disastrous impact on daily dental services. It also completely changed the future approach towards medicine and dentistry. This article focuses on the impact of the coronavirus on the field of implant dentistry. In particular, discussion of the environmental, clinical and psychological factors, as well as the economic impact, will take place. There are several recommendations proposed to introduce a safer workplace for both patients and clinicians in times of a viral pandemic.

I. INTRODUCTION

COVID-19 is an airborne infection that is spread by aerosols and through physical contact. General dentistry was extremely affected by this problem. Social distancing can restrict the spread of the virus, however this approach is impossible in dentistry where practitioners are always in close contact with their patients during treatments. Implant dentistry is a specific and popular field in dentistry that avoids the use of high speed handpieces and therefore the generation of aerosols, allowing the treatments to be performed in a sterile surgical environment. Even the application of water coolant is not a necessity. The COVID-19 pandemic made healthcare professionals – and implant dentists in particular – take extra measures to deliver exceptional care in the safest possible environment.

Environmental impact and perspectives

Preselection and triaging over the phone as well as emails or online communications are and will continue to be mandatory. Patients with symptoms of a COVID-19 infection should be prohibited from entering the implant clinic. Surgical procedures should by all means be performed under maximal aseptic conditions, using disposable protective equipment where possible. Preparation of the surgical room before and after the treatment, along with the handling of instruments should be carried out up to the highest standards.

Diagnosis

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Even though the experts agree that direct presence of the patient for a clinical examination is still a requirement of the appropriate diagnosis of a patient candidate for dental implants, the use of teledentistry will increase and thus reduce the duration of consultations and the exposure of staff and patients. In this sense, the use of a digital dental records could also be advised.\textsuperscript{11-13}

**Surgical treatment**

There was a very high consensus towards the use of mouthwashes before each intervention and the reduction of aerosol-generating instruments during surgical procedures, which should be taken with caution since there is not sufficient clinical evidence to support the antiviral activity of reagents in mouth rinses against SARS-CoV-2.

**Prosthetic treatment**

Experts agreed that the current situation will accelerate the shift from conventional prosthetic methods to a full digital workflow in implant dentistry. There was a very high consensus towards the increased use of CAD/CAM technologies. Experts also agreed that it is currently necessary to apply strict methods of infection control during the restorative procedures, by disinfecting all prosthetic components and impression materials.\textsuperscript{11,14,15}

**Peri-implant diseases and maintenance**

This problem could be counteracted by the use of telemedicine, providing a quicker access to the dentist without attending the dental office.\textsuperscript{5,7,16,17}

**Disinfection**

The surgical theatre can be disinfected by using commercial UV-C (ultraviolet-C) beams. UV-C beams with a wavelength of 254nm have a germicidal effect on bacteria and viruses, producing damaging consequences on the reproductive apparatus of both microorganisms. The equipment can reduce both bacteria and viruses in ambient air up to 90\% and the airflow capacity can rise to 120m\(^3\)/h.\textsuperscript{18-20}

**Clinical impact and perspectives**

Clinically the focus should be on (1) reducing the number of appointments, (2) avoiding specific treatment options, (3) applying extra tools and (4) implementing new techniques.\textsuperscript{20-23}

**Reduce the number of appointments**

Non-submerged techniques, Avoiding compromised patients, Full digital workflow.

**Avoid specific treatment options**

Radiology: extraoral radiographs have a low risk of infection in comparison to intraoral techniques.

Piezosurgery: This equipment is not advised.

Sinus lift: when bone augmentation is indicated in the posterior maxilla, a closed (Summers) technique is preferred (Summers, 1994).

Magnification: the use of loupes or microscopes during treatments ensures a distance is maintained between the practitioner and the patient.

**Rinsing**

Coatings: recent research reported that copper-alloy coatings reduce the survival of coronavirus to less than four hours.

**Implement new techniques**

It was believed that low-speed drilling without adequate cooling overheated the bone and lead to osteoblast degeneration.

Bicon: It is used with a slow speed drilling handpiece (50rpm) in the absence of coolant.
Nobel Biocare N1: this implant also requires slow speed drilling with the absence of a cooling mechanism.22

Psychological impact and perspectives
Due to the coronavirus pandemic and resulting lockdowns, the population were under extreme stress leading to general fear and anxiety. This overall insecurity often results in mental instability.4,15,18,21 To contend with these issues, they must try to maintain a healthy state of mind. Survival stress, quality stress and organisational stress can all impact a dental practitioner’s mental health. Furthermore, dental clinicians face the daily risk of infection due to their job.1,5,18

Economic impact and perspectives
The economic impact of the pandemic also has two components: impact on the patients and impact on the clinicians. Both groups face financial insecurities, due to reduced income and rising expenses. For patients, this often leads to choosing personal care expenses over more expensive treatments (like implant-supported rehabilitations), which are consequently postponed.14,16,22 Dental practitioners on the other hand, are confronted with additional expenses that do not increase their income. Only rarely is the government willing to support those extra costs. This leads to a lack in return on investment. It can cause huge financial problems for new or recently opened practices, or clinics with an unstable financial basis.

Biosecurity
The dental team has been regularly using infection control measures before the COVID-19 pandemic, however, most of the experts responded that these measurements should be enhanced in light of the SARS-CoV2 infectivity, mainly in cases of procedures generating aerosols.14 However, the experts did not agree on whether full personal protective equipment should be worn for each patient. Moreover, there was no consensus on the need of diagnostic for SARS-CoV-2 virus to every patient in the dental clinic,17 since some experts found it unattainable. Instead, experts suggested the filling by every patient of a self-reported medical questionnaire and telephone triage prior to each appointment, as well as the strict abidement to all the infection control measures during the patient visits to the dental office. Experts found this protocol sufficient to reduce the risk of infection in the dental office, in line with international recommendations.15-23

II. CONCLUSION
Previous pandemics often lasted several years or even decades. It is possible that we will have to face the coronavirus pandemic for longer time than we would like. The development of vaccines has occurred. But there is no security that they will be functional against the eventual mutated SARS-CoV-2 variants that may develop. The only thing we have in our own hands is the ability to protect ourselves as much as possible. Implant dentistry can contribute to this protection by taking extra measures into account. Using an aseptic surgical approach, employing air decontamination with UV-C, applying a non-submerged surgical approach, using lower speeds (without irrigation) for the osteotomy preparation, using intraoral scanners and introducing a full digital workflow. Patients should always rinse before any intraoral manipulation. Defeating this pandemic is something we all will have to do together.

REFERENCES

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