

Personnel Protective Equipment: Forgotten Protocol, Invigorated by COVID-19

Namdeo Prabhu¹, Rakhi Issrani²

¹Department of Oral & Maxillofacial Surgery and Diagnostic Sciences, College of Dentistry, Jouf University, Sakaka, Kingdom of Saudi Arabia.

²Department of Preventive Dentistry, College of Dentistry, Jouf University, Sakaka, Kingdom of Saudi Arabia.

Correspondence: Dr. Rakhi Issrani, Lecturer, Department of Preventive Dentistry, College of Dentistry, Jouf University, Sakaka, Kingdom of Saudi Arabia. **E-mail:** dr.rakhi.issrani00@gmail.com

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ABSTRACT

Objective: To make the readers cognizant about the use of Personnel Protective Equipment (PPEs) and infection control practices which should always form a part of basic patient management and not arise with every emerging disease. **Material and Methods:** Authors personal clinical experiences and existing literature were summed up to infer relevant information related specifically to dentistry. A comprehensive review was done for the last 15 years in an attempt to explain the current state of understanding on the topic. **Results:** The authors have tried to compile the most probable reasons as to why PPEs have been a forgotten protocol, which can be enumerated as follows: decreased awareness, financial issues, boredom and lethargy, time constraints, unavailability, carelessness, and burnout due to long procedure and patient feeling discomfort/offended. **Conclusion:** COVID-19 being highly infectious, a dental clinic is a potential and genuine point of source for many new infections, and no confabulation is less to underline the importance of using PPEs during this pandemic or even otherwise.

Keywords: Coronavirus Infections; Protective Devices; Masks; Patient.

Introduction

It's been decades since modern dentistry has evidently proved the infection spread in a dental set-up, but we as dentists have happily turned a blind eye to the need of scrupulous infection control practices. This debauchery with microbial flora in a dental set-up is well-known notoriety. Better said than done! The highest degree of patience, dedication and perseverance is completely missing from the majority of the set-ups, and directly or indirectly, the rise of COVID-19 has led to the invigoration of the use of personal protective equipment (PPE) in the dental set-up. How many of us are aware about the spread of microbial flora in the dental set-up? All the legitimate professionals who endeavour in dentistry for decades are well aware of this fact. But how many of us really take a step beyond and make genuine efforts to curb the spread or for that matter, protect themselves and patients from the microbes? No words can describe this gonzo of carelessness, as is evident in our day-to-day life. Studies previously have shown that the acumen behind not using PPE was either a busy schedule (37.1%) or emergencies (91.4%). Also, the fact that the patients may get offended (27.1%) or the PPE can cause discomfort (24.2%) was a legitimate concern. Many a time, refute by co-workers (67.1%) was also seen [1].

Material and Methods

Authors' personal clinical experiences and existing literature were summed up to infer relevant information related specifically to dentistry. A review was done for the last 15 years in an attempt to explain the current state of understanding on the topic.

Results

What are the basic reasons why PPEs are not being used?

The authors have tried to compile the most probable reasons as to why PPEs have been a forgotten protocol, which can be enumerated as follows:

1. Decreased awareness: It is difficult to fathom that in the present scenario, any dentist practising is not aware of using PPEs during routine procedures. Every dental student, even before they enter clinics, is well aware of various procedures and they are taught stringently how to follow the protocol. However, over the years, many tend to overlook the conditioning and hence the continuing dental education (CDE) comes to the rescue. Timely overhauling of various practices fortifies the minds of practising dentist and hence many nations have today made CDE an inseparable part of the profession.

2. Financial issues: This is one of the genuine reasons that many dentists in many countries, especially those belonging to the third world face are not able to use the PPEs and directly or indirectly, the costs are borne by the patients. Nevertheless, countries like India provide the PPEs for as less as 10 USDs, which the majority of people can afford and definitely is far less worth than the spread of disease and ensuing medical care.

3. Boredom and lethargy: Nothing can be more shameful than the act of perilous nature. Boredom to dress yourself with protective equipment has no place in the medical practice and should be condemned at all levels.

4. Time constraints: Many times, due to patient load, the dentist is not able to change the PPE or dress himself properly and this might prove cataclysmic as it might lead to cross infections like a cakewalk. One of the best ways to avoid this is the timely appointed system where some cushion of space should be provided to wash hands, change PPE and make yourself prepared in the sequence of chronology.

5. Unavailability: Many a place still exists on this planet where-in PPEs might not be available, yet some makeshift PPEs made from cloths that can be easily autoclaved can be used for protection, albeit that is time-consuming and of less quality. But something is definitely better than not having at all.

6. Carelessness and burnout due to long procedures: Sometimes, the procedures may extend over the time of expectation, and the dentist, as well as the assistants, will become tired and, over time, will give less consideration to follow proper protocol. An outstanding way of tackling this issue is having a dental professional nearby who can lend a helping hand and also take over the procedure. While one dentist takes a break, other one with a fresh mind and enthusiasm can follow the protocols perfectly and both professionals can work in tandem.

7. Patient feeling discomfort/offended: The sight of operator and co-workers in full PPE suit can be overwhelming for some patients. They may get intimidated by the seriousness of the preparation and feel uncomfortable about the whole situation. They may also get an impression that the operator is being extra careful as some information about their health status has been held back. In lieu of coming unannounced in front of the patient in full PPE, it is essential to make the patient fully aware of the situation, explain the procedure, and prepare at the war front. This will allay any unexpected sights and make the patient more comfortable. Premedication for calming down patients in the form of nitrous oxide and benzodiazepines can also be considered, and general anaesthesia can be reserved for extremely phobic patients.

Discussion

Proper infection control practices are inseparable drills of every dental school education, and each and every patient is considered as a potential infection carrier. When there are already deadly diseases like HIV and Ebola present in circulation, there should not have been the rise in demand for PPEs and newfound interest in infection control regulations. Accordingly, the aim of this paper is to make the readers cognizant about the use of PPEs and infection control practices, which should always form a part of basic patient management and not arise with every emerging disease. Some, if not many, are even aware at all of various PPEs that are available at our disposal. The current global pandemic has been nothing but an eye-opener to most of us that how precarious are we towards infection control practices in general.

Preventive Measures as Laid Down by the World Body

World Health Organization (WHO) has laid down certain recommendations for preventing the spread of diseases [2]. These recommendations are applicable during the times of any pandemic and should be made as a part of routine dentistry. These are particularly important to mention before the use of PPEs and can be summarized as follows:

- 1) Maintain at least 1-meter distance between the individuals more so if any person shows any signs or symptoms of respiratory diseases;
- 2) Using disposable tissue papers/napkins while sneezing and coughing and use them as often as required;
- 3) Wash the hands with soap and water if visibly soiled and/otherwise use an alcohol-based hand sanitizer for antiseptic precautions if otherwise clean;
- 4) Use medical-grade masks and dispose of them properly after every use; and
- 5) Not to touch the parts of upper respiratory tract or eyes and hair.

WHO also recommends the use of PPE during the outbreak of COVID-19, according to the setting, personnel and type of activity as follows and as evidently seen from Table 1, aerosol producing procedures come under the high-risk category, which happens to be a regular part of a dental set-up.

Table 1. WHO recommendations for the use of PPE during COVID-19 outbreak.

Setting	Target Personnel or Patients	Activity	Type of PPE or Procedure
Health Care Facilities			
Inpatient Facilities			
Patient Room	Health Care Workers	Providing direct care to COVID-19 patients	Medical Mask Gown Gloves Eye Protection (Goggles or Face Shield) Respirator N95 or FFP2 Standard or Equivalent
		Aerosol-generating procedures performed on COVID-19 patients	Gown Gloves Eye Protection Apron
	Cleaners	Entering the room of COVID-19 patients	Medical Mask Gown Heavy Duty Gloves Eye Protection (if Risk of Splash from Organic Material or Chemicals) Boots or Closed Work Shoes
	Visitors	Entering the room of COVID-19 patients	Medical Mask Gown Gloves

Contents of a Perfect PPE Kit

A perfect PPE kit is one that contains the following: Surgical gloves, Facemask / respirators, Head cap, Surgical gown, Protective eyewear, Face shield, Earplugs and Protective footwear.

All complimented by the fact that surgical scrubs should be worn beneath the PPE and not the normal outdoor clothes. Also, it is expected that after every procedure PPE kit is discarded and at the end of that day or session, surgical scrubs are sent for cleaning and autoclaving to have perfectly clean attire ready for the next session. Surgical scrubs should be changed at very sight of soiling or blood and saliva splatters at any given point of time.

What is the Need to Follow the Infection Control Protocols Stringently in Dental Set-Up as Compared to Other Health Care Professionals?

Needless to say, that most procedures carried out in the dental office are invasive and we directly deal with oral cavity, which is a reservoir for all varieties of microbes and there is direct exposure of the operator to such a plethora of organisms. Only complicating the scenario is the usage of high-speed handpieces, micro-motors and ultrasonic scalers, which keep producing aerosols. These aerosols are liquid and solid particles (<50 µm diameter) suspended in the air for an extended period of time. Secondly, there is splatter, which is a mixture of air, water and/or solid substances (50 µm to several mm in diameter) [3].

Even though WHO has been at the forefront of fighting the COVID-19 crises and many such challenges before, it has resisted in parts that viral particles can indeed be floating indoors and lingers in air only to infect a new person. WHO has long maintained that coronavirus spreads by large respiratory droplets which fall on the floor when an infected person coughs and sneezes. But recently, 239 scientists in 32 countries

have outlined the evidence showing that smaller particles can infect people and are calling for the agency to revise its recommendations. So much so that researchers have decided to publish this finding by July 2020. Even in its latest update on the coronavirus, released June 29, the WHO said airborne transmission of the virus is possible only after medical procedures that produce aerosols or droplets smaller than 5 µm [4].


Nevertheless, dentists are at an alarming rate of exposure as aerosols are in fact produced, which can be up to 5 µm and directly working in the respiratory tract itself is an added peril. There is no reason why health care workers should not use NIOSH non-oil resistant 95 masks and other PPE gear to protect themselves from such respiratory droplets from infected patients, apart from the need to have more powerful filters in air circulation systems. Declaring the disease as air-borne will definitely raise awareness amongst the medical professionals and it will help reinforce the gravity of using PPEs. Washing hands has been given prime importance while creating awareness, but aerosols and contact surfaces are equally responsible, if not less, if medical set-ups are considered for the spread and this has been brought to notice even by Centre for Diseases Control and Prevention.


These aerosols are barely visible by the naked eye and settle on all the surfaces, which come in direct or indirect contact with the patient. Particularly exposed are the doctors and their assistants. In such schemes, the PPEs prove to be an indispensable tool to protect both professionals from these invisible droplets of infection. For most of our patients in routine dentistry for any elective procedures, regular surgical face masks, when used correctly and if frequently changed, does offer around 80% filtration rate. COVID-19 virus measures around 0.12 µm and aerosol particle sizes range from 3-100 nm. Filtering facepiece masks offers up to a 99% filtration rate of all particles measuring up to 0.6 µm [5].

Conclusion

There is no dearth of proof that pernicious infectious diseases come knocking on the doors of mankind every few years. Then why is the need of PPEs suddenly felt at the present of COVID-19 pandemic times? Such microbes are always lurking somewhere around the corner, only waiting to pounce upon a careless victim to make its presence felt. History does repeat itself and mankind tends to forget such warnings of the past and take away a huge chunk of population under the bus. Having said all this, there's no reason for any of us to overlook the importance of infection control protocols with respect to the PPEs and any health care provider deserves castigation for doing otherwise. COVID-19 being highly infectious, a dental clinic is a potential and genuine point of source for many new infections, and no confabulation is less to underline the importance of using PPEs during this pandemic or even otherwise.

Authors' Contributions

NP  <https://orcid.org/0000-0001-8699-4779> Conceptualization, Methodology and Writing - Original Draft.

RI  <https://orcid.org/0000-0002-0046-3529> Conceptualization and Writing - Review and Editing.

All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

References

- [1] Biradar SV, Narayan DP. Occupational hazards in dentistry – A review. *Asian J Pharm Technol Innov* 2018; 6(27):67-73.
- [2] World Health Organization. Rational use of personal protective equipment (PPE) for coronavirus disease (COVID-19). Available from: https://apps.who.int/iris/bitstream/handle/10665/331498/WHO-2019-nCoV-IPCPPE_use-2020.2-eng.pdf. [Accessed on November 2, 2020].
- [3] Coulthard P. Dentistry and Coronavirus (COVID-19) – moral decision-making. *Br Dent J* 2020; 228(7):503-505. <https://doi.org/10.1038/s41415-020-1482-1>.
- [4] The New York Times. 239 Experts with one big claim: The Coronavirus is airborne. Available from: https://www.nytimes.com/2020/07/04/health/239-experts-with-one-big-claim-the-coronavirus-is-airborne.html?utm_source=nl_landingpage&utm_medium=web&utm_campaign=covid_bytes_daily_newsletter. [Accessed on November 2, 2020].
- [5] Health and Safety Executive. Evaluating the protection afforded by surgical masks against influenza bio-aerosols: Gross protection of surgical masks compared to filtering face-piece respirators. Available from: <https://www.hse.gov.uk/research/rrpdf/rr619.pdf>. [Accessed on November 22, 2020].