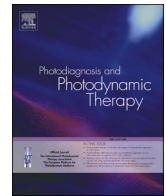




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Letter to the Editor



Ultraviolet irradiation as a disinfection protocol during COVID-19 outbreak for dental practices

Dear Editor-in-chief,

COVID-19 was declared a pandemic on March 11, 2020 once it had affected more than 12 world countries [1]. SARS-CoV-2 can be transmitted directly through coughing, sneezing and inhalation of virus containing droplets from infected individuals, in addition to contact with oral, nasal, and eye mucous membranes [2,3]. The dental office teams possess the highest risk of COVID-19 infection among all health professionals, due to their proximity to patients' mouths and respiratory tracts during dental procedures [2,4]. COVID-19 can be transmitted by saliva and other body fluids, as well as by the high-speed handpiece instruments that generate considerable amounts of potentially infectious aerosol and droplets [5]. Furthermore, any surface can be contaminated with viruses through contact with infectious body fluids or sedimentation of airborne viral particles, and thereby, promoting the cross-contamination between the dental office teams and patients [2,6].

In Dentistry, conventional cleaning and disinfection methods have been used for years, but their effectiveness are controversial for several reasons, such as the type of chemical products and procedures adopted, and whether or not they are used correctly; inadequate dilutions and contact times; and dependence of the human operator [7]. In terms of alternative sterilization methods, ultraviolet germicidal irradiation is a satisfactory disinfectant procedure [8]. Microbial nucleic acids absorb photons from irradiation source, causing the pyrimidine photoproducts formation, which subsequently damages the deoxyribonucleic acid (DNA), avoiding the replication, and inactivate the microorganism [9]. The maximum absorption wavelength of a DNA molecule is 260 nm, then ultraviolet C radiation (UV-C) lamps, within a wavelength of approximately 254 nm, is recommended to be used [8]. This disinfectant method does not depend on the operator, since the technology performs the whole procedure on its own, with minimal human intervention [7].

Ultraviolet light sources have proven effective against corona viruses [9,10]. Unlike UV-A and UV-B light sources, UV-C does not penetrate deeply into tissues; hence adverse effects are restricted to superficial layers of the skin and eyes [9]. In this manner UV-C could counteract COVID-19 through the sterilization of bioaerosols, and contaminated surfaces and instruments in the dental office [10]. UV-C disinfectant protocol have numerous advantages, including its facility to use, relatively short time duration, and its effectiveness is not dependent on the sealing of doors and/or air intakes, like the ozone protocol [10]. However, it is important to emphasize that the improper use of UV germicidal lamps could result in potential consequences like phototoxicity [11]. Its use is not recommended to the disinfection of hands or other skin areas, as UV radiation can irritate skin and damage eyes, promoting damage such as erythema, photokeratitis, conjunctivitis, and cancer risk [11].

Since the risk of spreading COVID-19 is very high, it is essential to emphasize the importance of improving/complementing sterilization

procedures, since proper disinfection of all structures in the operating room is necessary to prevent the uncontrolled spread of SARS-CoV-2 [12]. Therefore, ultraviolet germicidal irradiation, as an additional sterilization method, and not as a substitute, could provide enough energy to effectively decontaminate dental instruments and surfaces, providing greater protection for healthcare professionals and patients. However, only UV-C units with validated dosimetry should be used, and their handling by the operator must be done using specific protection equipment.

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Declaration of Competing Interest

The authors declare no conflicts of interest.

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