Review Article

Far-UVC light: A potential tool to control the airborne spread of Covid-19

Ahana Chandra[1*], Prof. H.C. Baranwal[2], Akriti Goel[3]

[1*]Ahana Chandra, BDS Final Year, Faculty of Dental Sciences, IMS, Banaras Hindu University, Varanasi, Uttar Pradesh, India-221005.

[2]Prof. H.C. Baranwal, Professor, Faculty of Dental Sciences, IMS, Banaras Hindu University, Varanasi, Uttar Pradesh, India-221005.

[3]Akriti Goel,Senior Resident, Faculty of Dental Sciences, King George's medical University, Lucknow, Uttar Pradesh, India-226004.

Introduction

Corona virus Disease 2019 (COVID-19) was first reported in December, 2019 and the same was declared a pandemic on March 11, 2020 by the World Health Organization. Despite the extensive measures that have been taken to curtail the spread of the disease, it has escalated worldwide to affect more than 12 Million lives.[1]

The causative agent for this disease is a beta coronavirus (SARS-COV-2) that is transmitted either through direct contact or via an airborne route. Various studies have shown that the virus is viable in areoles for at least 3 hours.[2]

Given the characteristic mushrooming of the disease via symptomatic as well as asymptomatic carries, it is of utmost importance that we look into not only curing the disease but also into technologies that can help in the inactivation or killing of the airborne virus, thus limiting the transmission.

Far UVC Light

Amidst the extensive research in this area, the researchers at Columbia University Irving Medical Centre have developed a new technology that is the power of UV light, which was and shown promise of limiting not just coronavirus but other familiar virus as well.[3]

According to WHO, the UV region covers the wavelength range of 100-400nm and is divided into:

i) UVA (315 – 400 nm)
ii) UVB (280 – 315 nm)
iii) UVC (100 – 280 nm)

Currently UVC light of 245 nm wave length is under use for sanitization of kits and devices. But exposure of these UV rays to human may cause skin cancer. According to the researchers at Columbia University Dr. Buonanno et al, Far-UVC light of wavelength 222nm efficiently and safely inactivates the airborne corona virus. It has been found potent enough to kill the seasonal coronavirus that are similar to SARS-COV-2. They have established that an exposure of UVC light of 222 nm at a low dose of 1.7 and 1.2mJ/ cm^2 for 25 minutes inactivated 99.9% aerosolized alpha coronavirus and Beta coronavirus OC43.[4]

Based on these results, a continuous exposure of Far-UVC light in public locations at recommended exposure (3mJ/cm^3/hour) for 25 minutes would cause 99.9% viral inactivation. Increasing the exposure by a factor of two would halve the disinfection time while maintaining safety. At a stretch, irradiation by this UVC light can be done up to 8 hours per day with permissible exposure limit being 23mJ/cm^2.

Not only this but they have also maintained that the far UVC light having low wavelength, high energy and low penetration power, cannot penetrate the surface layer of skin and eyes, nor has it been associated with noticeable ozone formation that could cause a respiratory hazard (as is generally seen with UVA and UVB).[5,6]

Conclusion:

Thus, Far- UVC light, could be a major breakthrough on our way to good riddance from SARS-COV-2. These findings could pave way for inventing devices or technologies that could eradicate coronavirus, including SARS-COV-2.

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