



Application of Laser Blue Light With a Wavelength of 405 nm in the Treatment of Patients With the Virus COVID-19

Ehsan Kamani, Mohammadreza Razzaghi

Laser Application in Medical Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

*Correspondence to: Ehsan Kamani, Laser Application in Medical Sciences Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Email: E110_k@yahoo.com

Published online October 3, 2020

Dear Editor,

Scientists are concerned about a new virus that has infected 11 million people and killed more than 500 000 around the world. The virus, which emerged in the Chinese city of Wuhan in December, is a coronavirus and belongs to the same family as the pathogen that causes severe acute respiratory syndrome, or SARS. It causes a respiratory illness called COVID-19, which can spread from person to person.^{1,2} Fatma Vatansever together with their research team in the year 2013 they came to this conclusion by testing on viruses and pathogens UVC, blue light, PDI are effective in inactivating pathogens without harm.³ Research on the use of lasers in viral mortality is not widespread, but a few studies have examined the effectiveness of laser blue light and LEDs in eliminating the virus. Diem ThoHo, with his research team studying 400 nm blue light, concluded that the results of their study provide the first piece of evidence that 405-nm LED light has antiviral activity.⁴ Some wavelengths can decrease microorganisms directly, such as blue, ultraviolet, or violet wavelengths. We can increase these effects by possibly combining this method with another method known as antimicrobial photodynamic therapy (aPDT). According to the mechanisms mentioned earlier, we are referring to the capabilities of PBM and photodynamic therapy. The best use is a combination of both methods, as mentioned earlier. The present treatments are focused on virus removal, tissue oxygenation, and the reduction or inhibition of the cytokine storm caused by severe inflammation. With a combination of these two methods, we can achieve these goals with minimal interference with pharmaceutical methods and battle this disease with biophysical agent.⁵ Blue laser light of different wavelengths has been reported to have positive effects on our immune system. It can be used for anti-microbial photodynamic

therapy (for bacterial, viral, and parasitic diseases).⁶ Based on past studies and the effectiveness of low-power laser light, we can use venous laser light in this method intravenously, but it should be noted that using blue light in a venous form is more cautious. Therefore, in the use of this method such factors as age, gender, weight, specific disease, and laser duration should be considered so that we could do this properly. The wavelength used will be 405 nanometers with the power of 1.5 to 2 milliwatts, which should not exceed the mentioned power due to the high energy of this wavelength, and the duration of laser radiation, according to the factors, should be from 10 to 20 minutes in 10 sessions. There will be a day in between. The goal is to reduce the inflammation of the lungs and increase the amount of nitric oxygen that will increase the body's immunity and improve oxygen delivery to blood and tissues.

Ethical Considerations

Not applicable.

Conflict of Interests

The authors declare no conflict of interest.

References

1. WHO. COVID-19. Available from: <https://covid19.who.int/>. Last updated July 4, 2020.
2. Lodish H, Berk A, Zipursky SL, Matsudaira P, Baltimore D, Darnell J. Molecular Cell Biology. 4th ed. New York: W. H. Freeman; 2000.
3. Vatansever F, Ferraresi C, de Sousa MVP, Yin R, Rineh A, Ahrma SK, et al. Can biowarfare agents be defeated with light? *Virulence*. 2013;4(8):796-825. doi: 10.4161/viru.26475.
4. Ho DT, Kim A, Kim N, Roh HJ, Chun WK, Lee Y, et al. Effect of blue light emitting diode on viral hemorrhagic septicemia

- in olive flounder (*Paralichthys olivaceus*). *Aquaculture*. 2020;521:735019. doi: 10.1016/j.aquaculture.2020.735019.
5. Fekrazad R. Photobiomodulation and antiviral photodynamic therapy as a possible novel approach in COVID-19 management. *Photobiomodul Photomed Laser Surg*. 2020;38(5):255-257. doi: 10.1089/photob.2020.4868.
 6. Razzaghi MD, Kamani E. Role low-power blue laser with a wavelength of 405 nm in increasing the level of nitric oxide in increasing the resistance of cells to the virus (COVID-19) and its effect on virus (COVID-19) mortality in vitro. *OSP J Case Rep*. 2020;2(3):1-3.