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Research Article

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

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Abstract

In today's world, the spread of coronavirus has disrupted the lives of society as a whole, and the goal of all research groups is to discover a cure for this emerging virus.Now, based on the studies we have done in this article, we have examined a research title that requires extensive experiments in this field so that we can achieve effective therapeutic results with this type of laser.

Keywords: Laser; Low Level Laser; Virus; Corona; COVID-19; Nitric Oxide

COVID-19

A virus is a small parasite that cannot reproduce by its own. Once it infects a susceptible cell, however, a virus can direct the cell machinery to produce more viruses. Most viruses have either RNA or DNA as their genetic material. The nucleic acid may be single or double-stranded. The entire infectious virus particle, called a virion, consists of the nucleic acid and an outer shell of protein. The simplest viruses contain only enough RNA or DNA to encode four proteins. The most complex can encode 100 -200 proteins. Since many viruses can infect a large number of different cell types, genetically modified viruses often are used to carry foreign DNA into a cell. This approach provides the basis for a growing list of experimental gene therapy treatments

These viruses were originally transmitted between animals and people. SARS, for instance, was transmitted from civet cats to humans while MERS moved to humans from a type of camel. Several known corona viruses are circulating in animals that have not yet infected humans. The name corona virus comes from the Latin word corona, meaning crown or halo. Under an electron microscope, the image of the virus looks like a solar corona.

Scientists are concerned about a new virus that has infected tens of thousands of people and killed more than 2,000. 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.

Coronaviruses are a large family of viruses that can make humans and animals sick. They cause illnesses that can range from the common cold to more severe diseases. Coronavirus (COVID-19) is a respiratory illness caused by a new virus. Symptoms range from a mild cough to pneumonia. Some people recover easily, others may get very sick very quickly. There is evidence that it spreads from person to person [1].

Laser is meant to amplify light by induction emission, and it can be briefly stated that some materials can absorb the radiation energy and then radiate it into the light when this occurs naturally in the atom. Speech is called spontaneous emission, and what you know in nature as light is the result of spontaneous emission [2].

The Blue Laser

The blue laser has very positive effects on our immune system. Furthermore, wound healing is improved significantly. There is also a strong anti-inflammatory and anti-bacterial effect as well as positive influence on hormone harmonization and pain reduction. It improves cell perfusion and oxygen uptake. The biochemical mechanisms are quite complex. However, there is an improvement of ATP metabolism (leading to more cell energy) and positive influence on hemoglobin nitric oxide (HbNO) release after blue laser blood irradiation.

Stimulates complex I of the mitochondrial respiratory chain (NADH-dehydrogenase complex).

It has very strong anti-bacterial effects by destroying microorganisms of all kinds in the blood (by absorption of bacterial porphyrins and by production of reactive oxygen species).

Releases NO from the NO-Hb of micro circulation (Nitric Oxide).

Can be used for photodynamic tumor therapy in combination with Curcumin as photosensitizer.

Can be used for anti-microbial photodynamic therapy (for bacterial, viral and parasitic diseases) in combination with Riboflavin as photosensitizer [3].

Laser and Virus

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 have been shown to be effective in inactivating pathogens without harm [4].

Research on the use of lasers in viral mortality is not widespread, but with a few studies, the effectiveness of laser blue light and LEDs in eliminating the virus can now be studied. Diem ThoHo, with his research team studying 400 nm blue light, concluded thatThe results of this study provide the first evidence that 405-nm LED light has antiviral activity [5].

NO

The production of NO in the immune system and the mechanisms of NO antidepressant regulation are key to many of the capabilities and characteristics of immune cells, including dendritic cells, NKs, mast cells, macrophages, and other phagocytes [6].

Cuzzocrea And colleagues in 2000 conducted experiments to conclude Immune NO functions in the immune system include cytotoxic and cytoprotective, antiviral, antimicrobial, stimulating and suppressing the immune system [7].

Blue laser increases nitric oxide (NO) Nitric oxide and mitochondrial biogenesis. Chronic, smaller increases in NO levels stimulate mitochondrial biogenesis in diverse cell types. Increased oxygen binding to red blood cells [8].

Method

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, the use of this method should be all factors such as:

Age, gender, weight, specific disease, and laser duration were considered so that we could do this properly.

The wavelength used will be 405 nanometers with a power of 1.5 to 2 milliwatts, which due to the high energy of this wavelength should not exceed the mentioned power, and the duration of laser radiation according to the factors from 10 to 20 minutes in 10 sessions. There will be a day in between

The goal is to reduce inflammation of the lungs and increase the amount of nitric oxygen that will increase the body's immunity and improve oxygen delivery to the blood and tissues.

In vitro

On the other hand, using radiation on laboratory samples, it is worth researching, because with this wavelength, the coronavirus can be killed, or by making changes to the receptors of this virus, it can be changed in a way that we can use in vaccine preparation. Do these two cases are a basic study method that is presented to all researchers to accelerate the process of research work.

We cultivate the virus in a laboratory environment and irradiate the water laser in the environment. The maximum irradiation time is 10 minutes with a power of 2 mW [1-10].

Conclusion

The prevalence of viruses COVID-19 in the world is one of the most important current diseases and its treatment is one of the goals of the world health systems. But there are fewer applications of modern medical laser science, so in this ar-ticle we tried to provide a preventive approach by recogniz-ing the light and beam properties and studies in this area in this article, we have examined a research title by creating a suitable platform for accelerating the recovery of patients with corona. Therefore, the effectiveness and role of laser blue light in increasing nitric oxygen and increasing cell safety, as well as the use of this wavelength in the laboratory environment for a more detailed study to eliminate the corona virus in this article are described [11].

Conflict of Interests

The authors declare no conflict of interest.

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