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Original Article

Impact of Diode Laser on Lymphocytic Cell and DNA

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Abstract:- In this study, the effect of the laser (532nm) on (40) samples equences comprise equally twenty male and twenty female ones were collected from (20 to 47)years old individuals by using Laser (532nm), power 20mw and the time of exposure (5,15and 30 min), the sample was divided into four sample for irradiation and control . The results of this study show the average percentage of surviving lymphocytes being (32.12±6.178) different exposures of laser (5,15 and 30 min), lead to the changes in the portion of live lymphocytes. The proliferative moment of the cells show almost exact the same regularity as seen in the untreated cells before as well as after diode laser (532 nm, 20 mW). found decrease in DNA retention (OD) for the following three doses (5,15 and 30 min) which is a sign for DNA focal stability reduction compared to standard DNA (OD) obtained the figure of survival DNA as(85.5%, 88.5%, and 87.1%)each round. However, these results may confirm that DNA of diode laser (532 nm, 20 mW) irradiation is damaged at the degree immediately after exposure irradiation.

Keywords: Impact, Laser, Lymphocytic Cell, Density, DNA

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Introduction:

The influence of diode laser(532 nm, 20 mW) irradiation , is a specific type of laser which provides coherent light of an interesting nature. the waves of light which vibrate harmonically or the phase matched with each other. The most emission from a laser(532 nm, 20 mW) irradiation This wavelength is very much capable of providing the integral characteristics that made it very popular to many research and medical fields. Where the results were,The spectrum of electromagnetic radiation (EMR) stretched from the short wavelength of X-rays and gamma rays to the long wavelength of microwaves and radio waves. at the purposes to examine the benefits and drawbacks of diode laser (532 nm, 20 mW) in terms of working with lymphocyte cells as well as their DNA. Medical therapies and tests can be

positively enhanced also by laser irradiation as it will lead to increased cell viability besides trigger off beneficial second messenger pathways resulting in little DNA damage. However, the damage to the cells or genetic integrity by lasers warrants formulation of the specific standards and covenants sustained till the desired use of lasers in medical treatments is established.

Activation of life processes under laser radiation, often called biostimulation , is of most interest . Under large doses of laser radiation, its positive action changes, as a rule, into inhibition of vital activity processes, which is a main hindrance to a successful application of laser therapy and a cause of disappointment.

Biophotonics

a collaborating science in biology, optics, and photonics, is the study on light's interaction with living organisms. It deals with so much complex issues, involving diagnostics and imaging to medication and treatments. It may be possible to advance the field of bio photonics with the knowledge of the role laser(532 nm, 29.5 mW). play in influencing the lifespan of DNA and lymphocyte cells that may lead to better, safer and more efficient medical equipment and processes.

Lymphocyte Cells

Lymphocytes number in adults is in the range of 1,000 - 4,800 cells per μL in blood. In the paediatrics, the normal range for lymphocytes is estimated to be 3.5 thousand to 9.5 thousand cells per microliter of blood. Lymphocytes comprise about 20 to 40 percent your total WBCs.

Lymphocytosis that is increasing the number of lymphocytes in the blood is also known as lymphocytosis. Infections and illness (disease) are top contributors to the lymphocytosis process. However, sometimes your immune system can respond in an inappropriate manner by significantly increasing the production of lymphocytes to fight against the infections plus a variety of disorders. This is a situation where a high lymphocyte count is not particular surprising. This is in itself an indication that the patient has a higher-risk condition.

The immune negative system uses lymphocytes, the white blood cells. Basically, their job is to search for and destroy any harmful microorganisms, bacteria, virus or other organisms that may want to invade the body. The T cells of the immune system are also capable of destroying infected cells where they are supposed to perform a range of other functions; antibodies are on the other hand produced by B cells. Understanding such a subject, induced lymphocytes by radiation, is a must for developments in immunology and medicine.

As for the lymphocyte cell behaviour, reactivity to laser light, and cellular longevity are fundamental research areas with respect to lymphocyte cells' physical appearance and functionality. Scientists may place the cells into extremes and execute them to modify the maturation when they act the same way under irradiation laser irradiation, and if there are visible functional changes. The secret we are holding tightly in our hands won't lose its significance if the laser heals the cells or not; the main task would be to make sure it does no harm to their inner processes.

DNA Damage Could Occur: Mainly, our investigational work centralizes on tuning whether lymphocyte cells outdoor DNA damage when they are exposed to the laser.

Disruptions, errors in structure, DNA chain breaks and other types of the damage are just few examples how damages show themselves in molecule. Further investigations would be possible to study different effects of employing lasers in biological centres if we identified this kind of lesion.

Method

From our blood bank, 40 samples sequences comprise equally twenty male and twenty female ones were collected from 20 to 47 years old individuals. The mean (± SD) duration of time between the samples to be tested was 33.5±8.21. The effects of the laser(532 nm, 29.5 mW) on lymphocyte cells of human blood were assessed by the process. The samples from which I take DNA sequences comprise equally twenty male and twenty female ones. The Tests for Blood samples were scheduled in two separate groups, consisting of total of Eighty tests in each group. The first group of thirty samples was chosen and were studied for peripheral blood lymphocyte cell dissociation, using the Boyum technique in order to find out whether laser(532 nm, 20 mW) has any effect on lymphocyte cells. 50 patients who had given blood are analysed for the impact of laser(532 nm, 29.5 mW) pre-illumination. The purpose of

laser(532 nm, 29.5 mW) pre-illumination is to bring lymphocytes to life. Through spectrophotometer and the haemocytometer, we calculated the number of lymphocyte cells destroyed by the laser(532 nm, 29.5 mW) and the DNA grouping and the size of the lymphocyte cell with the digital microscope and the image analysis software.

Results

By obtaining the arithmetic mean and the standard deviation of each set of data found that the results have the same response for after exposure laser (532 nm, 20 mW). The P-value was used as a benchmark, and any difference with a value below 0.05 was deemed as significant.

Concerning lymphocytes ratio which are described in table (1), there is a significant ($p<0.05$) The lymphocytes blood cell lymphocytes ratio viability after exposure to laser.

The average percentage of surviving lymphocytes being 32.12±6.178. As is demonstrated in Table 1, different exposures of laser (5,15 and 30 min), lead to the changes in the portion of live lymphocytes. The proliferative moment of the cells show almost exact the same regularity as seen in the untreated cells before as well as after diode laser (532 nm, 20 mW). irradiation , with a death curve reaching its minimum value at the beginning of the experiment.

Table 1: The mean percentage lymphocytes% of control and after exposure laser (532 nm, 20 mW).

Time exposure(min)	control group	laser (532 nm, 20 mW)
5	32.12±6.178	33.60*±8.446
15		32.85±0.658
30		32.95±1.436

-Values are means ±SD

-Means with asterisk * are significantly different at $p<0.05$

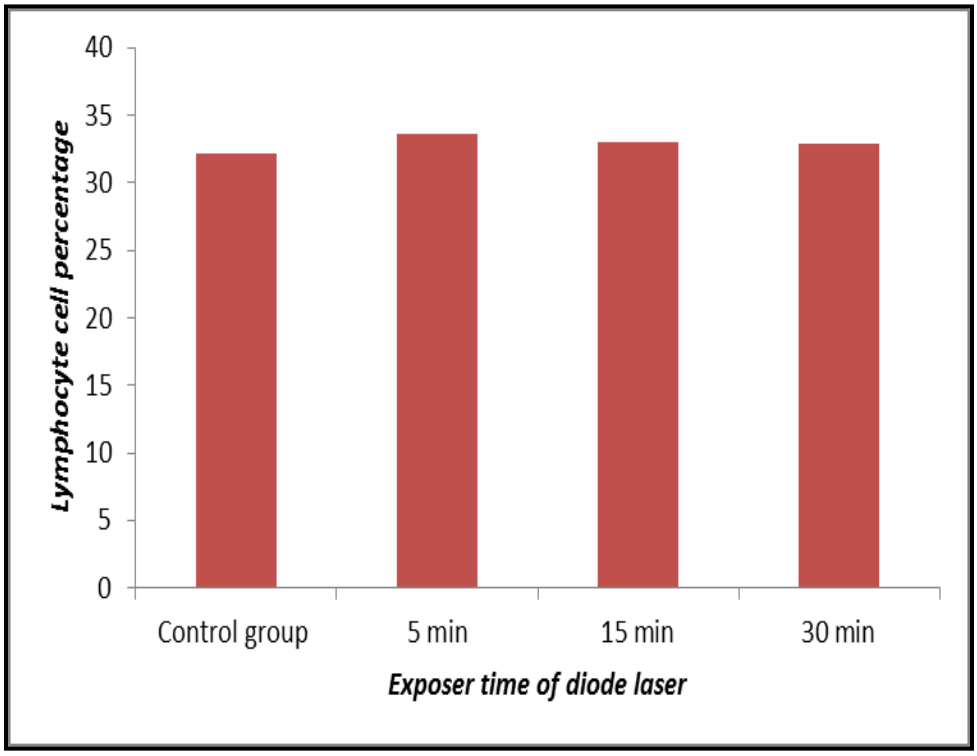

Fig1. percentage lymphocytes% of control and after exposure diode laser (532 nm, 20 mW).

Table 2: Analysis of DNA optical density (OD) before and after exposure to diode laser (532 nm, 20 mW) irradiation using a spectrophotometer in wavelength550nm.

Time exposure(min)	OD before laser	OD after laser	DNA survival %
5	4.21+0.40	3.21+0.45	85.5+6.7
15	4.31+0.39	2.89+0.44	88.5+9.5
30	3.56+0.19	2.1+0.30	87.1+6

-Values are means ±SD

In Table 2 is presented an OD plot of DNA molecules during diode laser (532 nm, 20 mW) irradiation as well as when other environmental factors are involved. As a result of the diode laser (532 nm, 20 mW) only light, we found decrease in DNA retention (OD) for the following three doses (5,15 and 30 min) which is a sign for DNA focal stability reduction compared to standard DNA (OD) (bared control) results. Based on the three rounds of laser illumination, we obtained the figure of survival DNA as 85.5%, 88.5%, and 87.1% each round. However, these results may confirm that DNA of diode laser (532 nm, 20 mW) irradiation is damaged at the degree immediately after exposure.

Discussions

Our study of the impact of the diode laser (532 nm, 20 mW) on lymphocyte cells offered into a number of crucial findings. As if low-energy diode laser (532 nm, 20 mW) irradiation dose was relevant to an effect of lymphocyte (that one would assume would be different with the varied exposure duration). The results particularly served to prove that lymphocyte cell line remained unharmed by the prohesion of laser source, as the high mean values of viability percentage and minimal death or sub-lethal damages were observed. Besides, it did not affect and likewise did not influence the degree of DNS damage, but this type of DNA damage was more considerable than in control group. The reaction of lymphocyte cells to the diode laser (532 nm, 20 mW) irradiation is extremely delicate rather than linear and could be encompassed in the context of intricate and multiple signal pathways and cellular processes. Although these studies provide an incomplete picture, further research is required to fully comprehend the consequences by this effect on cellular health and performance. it is deducible that the lymphocyte mean viability shows a strong association with dosage of the laser emitted, this makes sense because the lymphocyte mean viability is Removing the lymphatic system post-radiation and providing an escape route for any cancer cells makes these unconfined cells very dangerous.

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