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SOFT LASER ENHANCE THE ACTION OF LYMPH NODULE IN DISEASED MICE INOCULATED WITH CARCINOMA

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ABSTRACT
Biological responses of cells to visible and near IR laser radiation occur due to physical and / or chemical changes in photo acceptor molecules, component of respiratory chains in mitochondria. As result of the photo excitation of electronic states, the follows of physical and / or chemical changes can occurs alteration of redox properties and acceleration of electron transfer, changes in biochemical activity due to local transient heating of chromospheres. Different reaction channels can be activated to achieve the photobiological macroeffects.

KEYWORDS: lymph nodule, Soft LASER, mice, carcinoma.

INTRODUCTION

The laser was recently become extremely important both in medicine and another medical application, soft laser have been used to achieve very precise therapeutic effects for biostimulation cells analgesic effects and anti-inflammatory effects[1]. Cell biostimulation proved by soft lasers is reflected through the formation of the following mechanisms reduction of cellular cariokynesis time which leads to faster wound healing, the increase of cellular ATP so that the potential cell energy is increased by stimulation of intra and extra cellular ions which supports biopolarization and then helps cellular exchange, stimulation of specific cellular elements depending on,their absorption potential regarding some wavelengths[2,3].All of these mechanisms of stimulation and regulation produce effects which favorite wound healing and swelling reduction which leads to total improvement of both arterioviral and lymphatic nutrition and microcirculation [4,5]. Several applications of laser in clinical procedures for dental hard tissues are either currently in practice or being developed since newer wavelengths as well as different methods and delivery systems are being applied in the field of dentistry.

In endodontic therapy lasers have been used as treatment coadjutant with reference to both, low intensity laser therapy (LILT) and high intensity laser treatment (HILT) to increase the success rate of the clinical procedures. Low intensity laser therapy has the ability to produce analgesic, anti- inflammatory and biomodulation effects on the irradiated soft tissue therapy improving the wound healing process and giving the patient a better condition of the postoperative experience[7,8,9]. The aim of the study was **t**o evaluate the effect of low level laser therapy (LLLT) on increasing the response of immune system by stimulating the lymph nodules action in order to inhabit cancer cells activity which leads to decrease the tumor size in diseased mice without using drugs and to verify the effect of low level laser (LLLT) on the lymph nodules biostimulation in case of disease by using different duration times at the same area in each irradiation with the same power densities.

MATERIALS & METHODS

Thirty mice were randomly assigned to two groups A,B each of fifteen mice, female, 60 days age, (45 ±2) gm main weight transplanted with cancer, subjects transplanted with mammary gland carcinoma in the Iraqi center of cancer research and medical genetics.

These two groups were sub grouped into five groups three mice each.

A. This group contains 15 subjects irradiated by laser of GA- Ar (Gallium- Arsenide) of wavelength 905nm with power densities of $50 mw/cm^2$ and different exposure time as shown in table (1) scarified in the day 3,6,9,12 and 15 after the 10 days of success inoculation (appearance of the tumor).
B. Control group, this group contains 15 subjects (negative laser) scarified in the day 3,6,9,12 and 15 after the 10 days of success inoculation (appearance of the tumor) also as shown in table (2), the lymph node of each scarified animals of group A and B were taken for histopathological examination.

RESULTS & DISCUSSION

Cell bio stimulation provided by soft laser or low level laser (LLLT) is reflected through the stimulation of specific cellular elements (1). Reflected through the stimulation of specific cellular elements[1]. Compromised cells and tissues respond more readily than healthy cells or tissues to energy transfers that occur between LLL and the cells[2]. LLL emitted photons and the receptive chromospheres that found in the various cells and subcellular organelles absorbed this photons stimulate the node activity especially the synthesis of plasma and macrophage cells [3,4,5].

The increasing that occurs in the plasma cells founded in the lymph nodules taken from the animal after laser irradiation.

In the case of cancer, the laser increases both vascular and cellular events[6] and injury responsive components such as mast cells, Bradykinins, and prostaglandins, with vascular response and membrane reactions [7,8,9].

All these responses increase the synthesis of macrophage and plasma cells that attacked the cancer cells [10] and increase the defiance of the body, also by increasing the production of ATP that enhanced significantly by laser that stimulate the cryotron c- oxidase[11], a chromosphere that found in the mitochondria of the cells played a major role in this stimulation[12,13,14]. The increasing of the immune response resulting in the decreasing / limiting the size of the tumor that measured before and after laser irradiation as that shown in the figures (1, 2, and 3).

From this study we can conclude that soft laser played an important role in both faster healing as shown in table 4and 6 especially in the early stage of the cancer in many locations as this study showed, and in activation of the immune mast cells founded in the lymph nodes that stimulated the defiance system to damaged /or to limit the increasing of the tumor growth as shown in table (3). This study also showed an increasing in the numbers of microphage founded in the treated lymph nodulesby laser, table 5 and 6 showed a comparison between the numbers of the microphage cells before and after laser irradiation.

TABLE 1: show the groups with respect to time of duration/day

Groups	A1	A2	A3	A4	A5
Time of treatment	3days	6days	9days	12days	15days
Number of the animals	3	3	3	3	3

TABLE 2: Different groups of mice inoculated by mammary gland carcinoma not irradiated by laser

	B1	**B2**	**B3**	**B4**	**B5**
	3 days	6 days	9 days	12 days	15 days
Number of the animals	3	3	3	3	3

TABLE 3: Diameter of the tumor (mm) before treating by laser

	3 days	6 days	9 days	12 days	16 days
Range	1.1-3.3	1.2-3.5	1.56-3.6	1.8-3.7	2-3.9
mean	2.2	2.3	3.5	2.7	2.8

TABLE 4: Diameter of the tumor (mm) after treating by laser continuously

Day of treatment	3 days	6-days	9 days	12 days	15 days
Range	2.5-2.54	1.9-1.4	0.9-0.4	0.4-0.4	0.4-0.2
Mean	1.104	1.65	0.65	0.4	0.3
SD	0.886				
R=-0.01	P=0.73				
B=-0.01	P=0.77				

TABLE 5: Count of Macrophages in the cervical lymph nodules before laser treatment

Range	Baseline	3 days	6 days	9 days	12 day	15 days
	3	4	5	6	8	10-11
Mean	3	4	5	6	8	10
Range=0.94	P=<0.001					
B=1	P=<0.001					

TABLE 6: The number of Macrophage in cervical lymph nodules after laser treatment

Range	Baseline	3 days	6 days	9 days	12 day	15 days
	2-4	3-5	3-5	8-11	11-15	15-18
Mean	2	4	4	13	13	16
Range=0.94	P<0.01					

FIGURE 1: shows a comparison between diseased mice not treated with laser

FIGURE 2: shows a comparison between treated and untreated mice

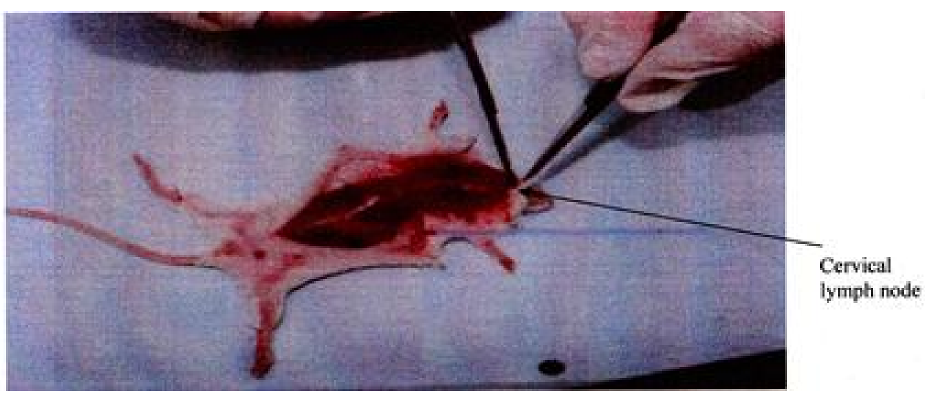

FIGURE 3: shows a cervical lymph nodule taken from the mice under study to histopath exam

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