A NEW APPROACH TO CURE IN PATIENTS WITH TYPE 2 DIABETES BY LOW-LEVEL LASER THERAPY

Tran Thien Hau*, Tran Minh Thai¹, Ngo Thi Thien Hoa²

¹Laser Technology Laboratory, University of Technology, Vietnam National University, Ho Chi Minh City, Vietnam
²The Clinic of Traditional Medicine, Tan Chau Town, An Giang Province, Vietnam

ABSTRACT

The main goal of our study is to observe the effects of low-level laser to cure in patients with type 2 diabetes in Vietnam. It is true that low-level laser therapy was gaining popularity in a variety of clinical application [1]. Application of low-level laser to cure in patients with type 2 diabetes is one of them. The initial results which have been a gradual effect is a proof shown that low-level laser therapy is useful in treatment.

INTRODUCTION

Diabetes mellitus (DM) is a serious chronic disease related with abnormally high levels of glucose in the blood. Insulin is a naturally-occurring hormone produced by the pancreas. Nonappearance or inadequate manufacture of insulin, or an incapacity of the body to appropriately use insulin gives rise to diabetes.

According to IDF [2], the global prevalence of diabetes in 2019 is approximated to be 9.3% (463 million people), standing up to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. The Ministry showed that Vietnam is among ten countries with the highest rates of diabetes patients in Asia while its patient growth is in the world’s top ten [3]. Especially, this rate is 4.4% in the whole country, in the big cities of over 6% of the population. In addition to this, it is true that the growing prevalence of diabetes are approximately 5.76 million people with diabetes currently living in Vietnam [3]. Diabetes is predicted to be one of the top seven diseases causing to demise and dysfunctions in Vietnam by 2030 [4, 5]. In inhabitant aged is predicted to raise the prevalence of diabetes to 7.0% and of prediabetes to 15.7% by 2035 [6]. Endocrinologist said that there had never been an effective method of before treatment.

Low level laser therapy (LLLT) is a general title to mention to many types of therapy based on photobiomodulation, a process that cause biological alterations in organisms due to photon interaction with atoms or molecules. The LLLT is more than an alternative kind of treatment; it is a whole new method to control cells and organisms by precise alterations in molecules. The LLLT empower the contemporary clinicians with a modern and transdisciplinary way to fight against diseases and other undesired conditions in humans and other animals. Moreover, it is a way to stimulate or inhibit some biological processes in all kind of known living creature, since LLLT acts in cell respiration [7].

Application of low-level laser therapy to cure in patients with diabetes mellitus is one of our research directions. In addition, we believed that the main problem of treatment of DM is maintenance of the fasting blood glucose and blood glucose after eating two hours return to the normal level and the normal HbA1c. Finally, we eliminate the risk factors, in order to minimize complications for the patients.

METHODS

The patients with DM had been lost a half β-cell function when they were diagnosed this disease. Therefore, protecting of the remained β-cells and adding in sufficient β-cells quantities is
the focus to reduce glycemic index in patients by low power semiconductor laser. From the above mentioned theories, content of the method included:

Use of the effect of two simultaneous wavelengths by semiconductor laser with 780nm and 940nm wavelengths which makes the biological responses by bio-stimulation occurs faster and stronger, when the laser beams directly impact on the pancreas and liver tissue from abdomen skin to recover their disorder [8-14].

Use of intravenous semiconductor laser with 650nm wavelength to make high quality blood to provide the pancreas and liver tissue and to improve gradually blood circulation, to recover their disorder. Beside, the most interesting finding was that intravenous semiconductor laser to boosts the immune system [15-18].

Use of opto acupuncture semiconductor laser therapy with 940nm wavelength impacts directly on acupuncture points to rehabilitate for pancreatitis and to reduce glycemic index in people with type 2 diabetes and rehabilitate disorder disordered liver function [19-20].

**DISCUSSION**

The purpose of this study is to present a new approach to cure in patients with diabetes to find effective ways for the elimination and control of diabetes, as well as to ameliorate the quality of life among diabetes patients in Vietnam. Application of low-level laser therapy to cure diabetes positive approach could be useful for the poor patients. Beside, they will avoid touse of diabetes pill abuse willy-nilly.

Karupfer formed the experiment with the culture of Hela cells. The results of this study shown that both the He−Ne laser and an ordinary source stimulated similarly the DNA synthesis after irradiation [8]. The previous works of Karu said that the effect of low-level laser on the biological system called that “laser biostimulation” was of a photobiological nature, and low-power laser effect could be related to well-known photobiological phenomena. Respiratory chain components were discussed as primary photo acceptors [8-11]. Bertoloni studied that irradiation of E.coli cells with either coherent or non-coherent 632.8 nm light created a stimulation of cell proliferation, which was maximal about 60 min after the end of the photo treatment [12]. Because of the effectiveness of the previous works [8-14], we used the effect of two simultaneous wavelengths by semiconductor laser with 780nm and 940nm wavelengths for treatment.

Chenzhong said that after irradiation laser of 532nm and 632, 8nm considerably increased NO concentration. Laser of 532nm, 632, 8nm and 650nm obviously increased serum NOS activity, and serum [-End concentration increased significantly after irradiation of laser of 532nm. It is probably that the wavelength was an important factor affecting the effect of intravenous laser therapy [15]. Weber examined the effects and mode of operation of intravenous Low-Level-Laser-Therapy of the blood consist of: improved the immunologic activity of the blood, the positive influence on rheological properties of the blood, diminishing tendency of aggregation of thrombocytes, an improved deformability of erythrocytes, improved oxygen supply and decrease of partial which is particularly relevant to wound healing. After laser-irradiation with activation of various metabolic pathways and increased production of ATP [16]. The work of Soheila reported that the combined local and intravenous LLLT develop the repair process of tissue of diabetic foot ulcer. They attained extraordinary shorter mean healing time after treatment compared with before treatment [17]. Kazemikhoo compared blood samples of nine diabetic type 2 patients, using metabolomics, before and after treatment with blue light laser. This study was designed to determine the significant positive effect of intravenous LLL Ton metabolites of blood in diabetic type 2 patients. From above studies [15-18] indicated that intravenous LLLT have the therapeutic potential in diabetic patients. So, we used intravenous semiconductor laser with 650nm wavelength for treatment.

Chen compared with sham acupuncture or no acupuncture plus baseline treatments acupuncture plus baseline treatments yield reduction in fasting blood glucose, 2 h blood glucose, HA1c. Their results also shown acupuncture can improve blood lipids and blood pressure control, and reduce weight [19], especially acupuncture with LLLT. By reason of that, we decide to use opto acupuncture semiconductor laser therapy with 940nm wavelength to cure this disease.

**Treatment equipment**

Based on the above researches, we made the equipment called Laser Semiconductor Opto acupuncture and phototherapy equipment (Figure 1) and the second equipment called Intravascular semiconductor laser equipment (Figure 2). The two equipment are manufactured by the Laser Technology Laboratory.

**CONCLUSION**

Clinical applications of low-level laser therapy are various. This approach could be better one of applications for curing diabetes. The field is characterized by a variety of methodologies and uses of various light sources (lasers, LEDs) with different parameters (wavelength, output power, continuous-wave or pulsed operation modes, pulse parameters). This could recommend us the possibility to use infrared low-power laser to cure the diseases. Vietnam is currently aiming towards a universal healthcare system to reduce healthcare...
costs. And application of low-level laser therapy is the great ideal to save costs. There are no report up to now about any serious side effects of low-power laser therapy. Considering the controlled low power of 1-2 mW they are not to be expected.
The method promises for the future an abundance of additional facts. It is interesting that here new ways open up in the treatment of common diseases. Especially diabetes mellitus, chronic hepatitis, cirrhotic liver and toxic leaver diseases, cardiovascular diseases and autoimmune diseases including allergies must be emphasized.

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References


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