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Opinion

The Role of Low-level Laser in Organ Transplantation

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Abstract

Organ transplantation means removing an organ (graft) from one person's body and transferring and placing it in the body of another person who has a defect in the function of the organ in question.

Keywords: heart; kidney; liver; lung; pancreas

Summary

Organ transplantation means removing an organ (graft) from one person's body and transferring and placing it in the body of another person who has a defect in the function of the organ in question. Today, organ transplantation is considered as the main treatment for patients who have experienced the failure of a certain organ of the body such as kidney, liver, lung, heart and pancreas. Organs that have been successfully transplanted to date include the heart, kidney, liver, lung, pancreas, intestine and thymus. Among these, the kidney is the most common organ that is transplanted, and liver and heart transplants are also in the next ranks. Transplant donors can be living people, brain dead or people who have lost their heart function and have no heartbeat. Based on the evidence, people who received a transplanted organ from living people, brain dead and people who died due to heart problems, respectively, had a longer survival of the transplanted organ. The successful transfer and placement of the organ in the patient's body is the first step to improve the health of these patients, which is considered one of the successes in modern medicine in the last half century. However, one of the main problems in the field of organ transplantation is transplant rejection. The fact that the immune system is the most important reason for the transplant reaction and can eventually cause the transplanted organ to suffer damage and dysfunction, immunosuppressive drugs were introduced. As their name suggests, these drugs weaken the immune system of the patients who are going to receive the organ and provide the conditions for the transplanted organ to be accepted by the recipient.

Lasers (Light amplification by stimulated emission of radiation) are devices that typically generate electromagnetic radiation which are relatively uniform in wavelength, phase, and polarization, originally described by Theodore Maiman in 1960 in the form of a ruby laser. Laser is described as a source of light or radiation energy. Low Level Laser (LLL) is a special type of laser that effects on biologic systems through non-thermal means. Low Level Laser therapy (LLLT) is the application of light to a biologic system to promote tissue regeneration, reduce inflammation and relieve pain. Unlike other medical laser procedures, LLLT does not have an ablative or thermal mechanism, but rather a photochemical effect which means the light is absorbed and cause a chemical change .The reason why the technique is termed low level is that the optimum levels of energy density delivered are low and it is not comparable to other forms of la There is evidence that LLLT is able to modulate the immune system at the skin and joint, and it has been shown to be efficacious in humans by affecting bacterial colonization as it may pertain to chronic rhinosinusitis. ser therapy as practiced for ablation, cutting, and thermal tissue coagulation. Due to the positive effect of cell activity, low-power lasers can prevent tissue rejection by entering the body and contact method in organ transplant patients. This issue has been stated for the first time that it will be a very serious and important issue in the treatment of patients receiving tissue. The effective role of laser therapy:

Regulating the activity of white blood cells

Prevent autoimmune activity

Increased blood supply and the most important angiogenesis factor

Improving blood system activity and organ function

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