



Perspective

Triple wavelength diode laser for hair removal: A perspective

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ABSTRACT

Unwanted hair growth on certain body parts is a common aesthetic concern. Different options including shaving, waxing, and chemicals are used for hair removal. These options provide temporary results; hence, laser therapy has become a popular option for hair removal among people. Significant advancements have taken place in laser devices for improving the results of hair removal. One of the recent developments in this area is introduction of triple wavelength diode laser for hair removal. This technology combines the benefits of three wavelengths in a single device. The triple wavelength laser device may particularly be beneficial for people with darker skin. Available limited evidence from small clinical studies suggests its efficacy and safety for hair removal in people with skin type III to V. Studies in Indian population are needed to provide further insights about its efficacy and safety in patients and acceptance by the clinicians.

Keywords: Hair removal, Cosmetics, Efficacy, Triple wavelength

INTRODUCTION

Unwanted hair growth on certain body parts is a common aesthetic concern.^[1] Today, even many male people also want to remove hairs for on different body parts including chest, arm, legs, or beard. The options for removal of unwanted hairs on body parts include shaving, waxing, or use of chemicals. Important limitation of these methods is their temporary results.^[1,2]

Laser and intense pulse light system devices can be an alternative option for hair removal.^[2-4] Laser hair removal has become one of the most popular option of treatments for the patients looking for long-term results of hair removal.^[5,6] Different types including long-pulsed alexandrite, diode, and Nd:YAG lasers are available options in laser therapy.^[2,7]

Different laser related parameters and patient characteristics are important in selecting an appropriate option for the patients. The laser related parameters include wavelength, pulse duration, fluence, spot size, and frequency and number of treatment sessions. The patients related factors include colour of the skin and hair, hair thickness, and site of treatment.^[2] The factors including the Fitzpatrick phototype and ethnicity are important parameters.^[5]

When selecting laser treatment, answers to the questions related to its effectiveness, onset and duration of results are important for patient counselling. Safety is also an important consideration of treatment. Some of the possible side effects with laser therapy include erythema, irritation, skin hypersensitivity, possibility of blisters due to burns, and hyperpigmentation. Patients should be informed about possible adverse effects associated with the therapy. They should be educated about the skin care to reduce the risk of such adverse events.^[5] Diode laser therapy is effective in people with all skin types according to the Fitzpatrick scale hair removal. However, concerns

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related to safety remains.^[5] Sensitivity depends significantly on ethnicity.^[8]

Laser devices differ in several aspects including handpieces, delivery of serial shots, cooling systems, and mode of applications. Lasers are divided into two types based on its application method: Static or dynamic. A study reported no difference in efficacy between two modes of application in terms of hair count.^[9] Among the different lasers, the 800~810 nm long-pulsed diode laser is one of the commonly used devices. It is less absorbed by melanin in the epidermis, hence can be useful in people with darker skin.^[2]

Rao and Goldman^[10] compared three laser systems individually and in combination for removal of axillary hairs in 20 females. Out of these, 17 females had dark coloured hairs and remaining three had red or light coloured hairs with the Fitzpatrick phototype II skin. The enrolled patients received three treatments at an interval of 6–8 weeks. The devices included long-pulse 755 nm alexandrite laser, long-pulse 810 nm diode laser, long-pulse 1,064 nm Nd:YAG laser, and rotational treatment consisting of a single session by each of the three laser systems. In this study, rotational therapy was not as effective as alexandrite or diode laser alone but was more effective than long-pulse Nd:YAG system alone. The patients with red or light-coloured hair and the Fitzpatrick phototype II skin showed lesser efficacy with laser treatment than dark-coloured hair and the same phototype.

TRIPLE WAVELENGTH DIODE LASER FOR HAIR REMOVAL

Triple wavelength combination laser is comparatively newer addition in the armamentarium for hair removal. Absorption, penetration, and coverage are important aspects while removing hairs using laser therapy. This laser offers sufficient wavelength for hair removal. Principle for the use of triple wavelength laser is “more the better.” The combination of three wavelengths is expected to provide better results than one wavelength laser in less time. Triple diode laser technology offers an integrated solution to the clinicians while using laser. This new laser provides benefits of three different wavelengths in a single device. The handpiece of this laser device reaches different depths within the hair follicle. The use of three different wavelengths together may provide beneficial results on these parameters. Clinician’s comfort and convenience are also not compromised while using triple layer diode laser for hair removal. Thus, triple wavelength diode laser may be a comprehensive option for hair removal. This laser may be specifically beneficial to people with darker skin tones. With its deepest penetration feature, it works well on deeply embedded areas like the scalp, armpits and pubic areas. Efficient cooling in the device makes the process of hair removal almost painless.

EVIDENCE FOR TRIPLE WAVELENGTH LASER IN HAIR REMOVAL

Traditionally, single wavelength laser device is commonly used for hair removal. Recently, it has been shown that laser device with combination of wavelengths produces effective results in hair reduction without significant increase in risks.^[11,12] Triple wavelength laser combines the synergy of three wavelengths 1064, 810 and 755 nm. Out of these three, 1064 and 810 nm have potential for deep penetration and hence focus on darker skin tones. Wavelength 1064 nm can be particularly useful for areas such as armpits and pubic area. Wavelength 810 is often used for areas such as arms, legs, and cheeks whereas 755 nm is useful for eyebrows and upper lip areas. We screened the articles related to safety and efficacy of triple wavelength laser for hair removal in PubMed and Google Scholar. We did not get any study with triple wavelength laser for hair removal in Indian patients. Only two studies have reported results of triple wavelength laser for hair reduction. Out of these, one study is prospective and other is retrospective. Kirit *et al.*^[11] have recently published their results of investigator initiated prospective study evaluating efficacy and safety of triple wavelength laser for hair reduction in 25 adult patients with skin types IV and V. The investigators used the Soprano Ice Platinum (Alma Lasers, GMBH, Germany) with the combination of three wavelengths at 755, 810, and 1064 nm. These three wavelengths are emitted in a single pulse. The areas treated with this laser device included face, neck, chest, beard, and other. All patients in the study completed six sessions. The most of the patients in this study were female. Clinical evaluation using the physician GAIS score showed excellent reduction hairs in 95.5% areas.

In another study, Lehavit *et al.*^[12] evaluated efficacy and safety of combined triple wavelength laser therapy for hair removal in adult male patients. They also used laser device with 755, 810, and 1064 nm (Soprano Titanium. Caesarea, Israel: Alma Lasers Ltd). This study evaluated 27 treatment sites among 11 people, with Fitzpatrick skin type III–V. The treatment parameters included Fluence of 7–9 J/cm² and pulse frequency of 9–10 H. The spot sizes were two cm² or four cm². The patients, in the study, underwent six treatment sessions with an interval of 6–8 weeks. Follow-up was done for 4–6 months. Effective hair reduction, high patient satisfaction without adverse events was observed with triple-wavelength laser device. This study had a limitation of retrospective design.

Fitzpatrick classification is commonly used for classification of skin, but its usefulness in dark-skinned people (e.g. Indian population) may need modification.^[13]

Structural and functional differences in the skin types based on ethnicity should be considered while using laser

therapy.^[14] Considering the physical characteristics, triple wavelength combination laser treatment may be better suited for Indian skin type. However, currently, there is no strong evidence regarding efficacy and safety of triple wavelength combination in Indian people. Large, well designed multi-center studies comparing traditional laser with triple wavelength combination will provide more insights about its efficacy and safety in Indian population. Limitation of such device is inability to select one or two wavelengths as triple wavelength is a default setting.

CONCLUSION

The principle of triple wavelength laser and related preliminary data from the clinical studies suggests that it is an effective and safe treatment option for hair removal. Studies from India are necessary to provide more information in clinical trial settings and real-life clinical practice.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Conflicts of interest

There are no conflicts of interest.

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