

Laser Diodo 800nm and Hirsutism in Darker Skinned Patients: Our Experience on 552 Women

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Abstract: Hirsutism is defined as excessive hair growth in areas usually associated with male sexual maturity, that is, on the face, chest, linea alba, lower back, buttocks, and anterior thighs. Hirsutism results from androgenic effects on the pilosebaceous unit and is commonly associated with acne and oily skin. In addition to being a source of social embarrassment, hirsutism may also be a cutaneous sign of a systemic disease.

The severity of hirsutism depends on an underlying disorder resulting in excess production or increased availability of potent or weak androgens (testosterone, dehydroepiandrosterone (DHEA) and androstenedione).

This study was designed to examine the safety and efficacy of laser hair removal using the LightSheer Diode EP Laser System on 552 women with hirsutism treated at the Andromeda Medical Office, Acireale, Italy from September 2008 till May 2015.

In this study LightSheer ET by Lumenis induced a significant rapid hair growth reduction that increased at long-term follow-ups.

Crusting was most common among women with thick black hair whose entire face was treated. In all the cases, however, these side effects disappeared within three days without causing any permanent hypopigmentation or hyperpigmentation.

The majority of patients experienced some pain during the procedure.

Keywords: Hirsutism, Diodo, Lightsheer, Women, Hairs.

1. INTRODUCTION

Hirsutism is defined as excessive hair growth in areas usually associated with male sexual maturity, that is, on the face, chest, linea alba, lower back, buttocks, and anterior thighs. Hirsutism results from androgenic effects on the pilosebaceous unit and is commonly associated with acne and oily skin. In addition to being a source of social embarrassment, hirsutism may also be a cutaneous sign of a systemic disease.

The severity of hirsutism depends on the underlying disorder, resulting in excess production or increased availability of potent or weak androgens (testosterone, dehydroepiandrosterone (DHEA) and androstenedione). Hirsutism may result from ovarian and/or adrenal overproduction of androgens or from some exogenous medications. Polycystic ovarian syndrome is the underlying disorder in the majority of women who present hirsutism. It is characterized by a particular ultrasound pattern of the ovaries and a variable endocrine and clinical picture [1].

Hirsutism may be idiopathic, due to androgen receptor hypersensitivity, or hereditary. It may result from an

increased end organ ability to produce dihydrotestosterone (DHT) from weaker androgens.

Many temporary hair removal methods exist, including shaving, tweezing, wax epilation and chemical depilatories. Most of these methods are tedious, others are invasive or time consuming such as electrolysis and thermolysis or take a long time to produce an effect. Other methods, such as antiandrogens, may interfere with hormonal profiles or a desire for pregnancy. The need for a rapid, permanent reduction and noninvasive method for hair removal has led to the development of various kinds of lasers.

The majority of Sicilian women have darker skin types III-IV-V as measured by the Fitzpatrick Scale. The development of lasers that provide the combination of longer wavelengths, longer pulse durations, and active cooling, has allowed people with darker skin types to take advantage of the efficacy, convenience, and permanence of laser hair removal [2,3]. This study was designed to examine the safety and efficacy of laser hair removal using the LightSheer Diode EP Laser System on 552 women with hirsutism treated at the Andromeda Medical Office, Acireale, Italy from September 2008 till May 2015.

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2. PATIENTS AND METHODS

Between September 2008 and may, 552 women between the ages of 15 and 50 with Fitzpatrick Skin Types varying from III to V were treated at the Medical Office. Table 1 describes the body areas treated, analyzed by patient skin type. Most of the women treated had Fitzpatrick Skin Types III or IV, and the large majority was treated on their face, neck, abdomen and pubis. Informed consent was obtained from each patient prior to treatment.

The laser model that we used was the 800 nm LightSheerDiode ET by Lumenis (with a 9 mm square spot). During this time period, the maximum pulse duration for LightSheer EP was 30 ms. Patients received between 3 and 8 treatments at 4 week intervals at fluences between 25 and 40 J/cm². Fluence was determined, prior to the initial treatment session, by maximum tolerated fluence -according to the patient pain threshold- and by minimal resulting erythematous reaction, without any evidence of burns.

When LightSheer EP was used, pulse duration was 30 ms for all treatments through the fourth session. In the fifth and sixth sessions, as regrowing hairs became finer in diameter, shorter pulse durations were used by treating using the OptiPulse™ feature automatic settings (Figures 1 and 2). In automatic mode, the pulse duration (in milliseconds) is automatically set to be one-half of the fluence value. The integrated sapphire contact cooling hand piece was always used. The ChillTip™ handpiece of the LightSheer laser contains actively cooled convex sapphire lens. When pressed against the patient's skin, before and during each laser pulse, this cooling device provides substantial thermal protection for the epidermis [4]. Compression of the target area also places hair bulbs closer to the upper dermis where the laser energy is at its highest. The combination of longer pulse widths and the unique

cooling system minimizes skin damage and allows for higher fluences to be used safely even in darker skinned patients [5].



Figure 1: Before treatment.



Figure 2: 12 Months after last treatment.

Post operative care for all patients included applying anti-inflammatory cream immediately after laser sessions, sun avoidance, and SPF 50+ sun screen cream application.

Table 1:

Area	Patient Number	Skin Type III	Skin Type IV	Skin Type V
Full Face/Neck	340	280	40	20
Perioral	33	32	1	0
Chin	18	13	4	1
Upper Lip	27	25	1	1
Breast	25	22	3	0
Abdomen	35	28	5	2
Bikini lines	54	53	1	0
Lower back	20	12	6	2

All patients were instructed to leave their hair unshaved for 5 days prior to treatment and to stop hair removal methods apart from shaving or using depilatory cream in between sessions. Areas of unwanted hair growth were identified and marked. They were measured using a transparent grid divided into equal 1 cm² squares of. The terminal hairs in 10 squares were counted and the mean was calculated every time. The differences between the mean before treatment and at 1, 6 and 12 month periods were determined. The primary outcome measure was the percentage of hair reduction, defined as the percentage of each difference with respect to the initial hair count before treatment. The other outcome was the estimated percentage of hair reduction that was based on visual assessment of the treated area. It included total apparent decrease in hair density, due both to actual decrease in hair regrowth, as well as regrowth of hair finer in diameter. At each treatment session, patients rated their satisfaction based on the total appearance of hair reduction including diminished regrowth of hair (Figures 3 and 4).

3. RESULTS

In this study LightSheer ET by Lumenis induced a significant rapid hair growth reduction that increased at long-term follow-ups.

The lack of any significant statistical difference between the response of pathological groups and idiopathic groups suggests that the inherent susceptibility of hair to laser irradiation is more important in hair destruction than in the physiology of hair growth [6]. It is interesting to note that medical treatment in the form of antiandrogens did not improve nor accelerate laser treatment response. This finding conforms to the Lumachi, Rondinone report [7] as antiandrogen drugs only have a suppressive and not curative effect that wears off a few months after cessation of therapy.

For the 340 women treated on their entire face and neck, apparent hair reduction was estimated to be around 70 to 80% after five or six treatment sessions. In the other areas treated, apparent hair reduction was higher, ranging from 80% to 95%, and for most treated areas, the women achieved satisfactory results within four or five treatments.

Overall, patient satisfaction was high with approximately 90% to 95% of patients satisfied with their results.

In the women treated, crusting appeared on the second day after the treatment session. Crusting was

most common among women with thick black hair whose entire face was treated on. In all the cases, however, these side effects disappeared within three days without causing any permanent hypopigmentation or hyperpigmentation.



Figure 3: Before treatment.



Figure 4: 12 Months after last treatment.

The majority of patients experienced some pain during the procedure. The pain was usually mild (42% of treatments) or moderate (49% of treatments) and only 2% of treatments were associated with severe pain. Topical anesthesia was used for only 20% of treatments and 6% of patients. The most commonly used topical anesthetic was EMLA.

4. CONCLUSION

Laser hair removal represents a significant advance in the treatment of hirsutism and other types of unwanted hair. It is effective, fast, convenient, and safe. Longer pulse widths and the unique cooling system available with the LightSheer Diode Laser System reduce skin damage and allow for safe and effective hair reduction even in darker skinned hirsutism patients.

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[http://dx.doi.org/10.1016/S0015-0282\(02\)04927-0](http://dx.doi.org/10.1016/S0015-0282(02)04927-0)

Received on 05-12-2015

Accepted on 16-12-2015

Published on 07-01-2016

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