

Efficacy and Safety of Intense Pulse Light in Idiopathic Hirsutism

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Background: Unwanted facial and body hair can cause severe cosmetic, social and psychological problems. Light assisted hair removal, using lasers and intense pulse light sources, because of their long term results and safety, has emerged as a promising method in hair removal.

Objective: To determine the efficacy and safety of intense pulse light (IPL) in the treatment of idiopathic facial hirsutism.

Setting: Dermatology Department Unit-II, Mayo Hospital, Lahore.

Duration of Study: Six months since 15th October, 2009.

Study Design: Experimental analytical.

Patients and Methods: It is an ongoing study of 50 patients and so far 46 with idiopathic facial hirsutism have been enrolled. All selected variables were recorded on a printed Proforma. The starting fluence and pulse duration were determined according to skin type. They were treated at 4 – 6 weeks interval for six treatments. Efficacy and safety was determined at the end of treatment. Efficacy was graded according to a 4-point scale from excellent to poor.

Results: Twenty eight percent patients in group A (completed 5 sessions), 11% patients in group B (completed 4 sessions) and 7% patients in group C (completed 3 sessions) showed excellent response i.e. > 75% hair reduction whereas 43% in group A, 56% in group B and 14% in group C showed a good response i.e. 50 – 75% hair reduction. Persistent erythema was observed in 16%, folliculitis in 13% and hyperpigmentation in 10% of the patients.

Conclusion: IPL is a safe and effective for treatment of idiopathic hirsutism.

Key Words: IPL, Idiopathic hirsutism.

Introduction

Hirsutism is defined as excessive hair growth in a female in male pattern distribution resulting from increased circulating levels of androgens or increased sensitivity of hair follicles to normal levels of circulating androgens. Underlying causes of hirsutism may be congenital adrenal hyperplasia, polycystic ovary syndrome, ovarian and adrenal tumors, pharmacological agents, familial or it may be idiopathic in origin.¹ Most women who seek treatment for hirsutism suffer from severe psychological and social problems.

Many temporary hair removal methods exist, including shaving, tweezing, wax, epilation and chemical depilatories. The need for a rapid, noninvasive method has led to the development of various light sources.² Although laser-like devices have been used for photoepilation without much success since 1969 but FDA approved the first laser (Nd: YAG) in 1995. Over the ensuing years, many new generations of lasers and light sources were marketed. These devices include ruby, alexandrite, diode lasers and an intense pulsed light source.³

Intense pulsed light (IPL) devices are, like lasers, sources of high-energy light. However, IPLs are polychromatic and emit multiple wavelengths with each pulse. Filters with different cut-off values tailor the wavelength range that is emitted to the cutaneous target of interest.³ Full spectrum (non-coherent) light and low-range infrared radiation are

filtered to allow a specified range of wavelength. This filtered light is delivered from a hand piece (flash lamp) into the skin, where it targets dark material such as the pigment in hair. This is intended to cause thermal and/or mechanical damage to a hair follicle while sparing the surrounding tissues. Xenon is commonly used as a light source. The efficacy of IPL can be explained by the fact that chromophores absorb light over a wide range of wavelengths, and so monochromatic light is not a prerequisite for selective targeting.⁴

Various studies have been conducted so far using different light assisted hair removal techniques and variable results have been reported but given the tremendous variation in laser techniques, the efficacy of procedure is difficult to study. Marayiannis *et al* reported no difference between the efficacy of long-pulsed alexandrite laser and IPL.⁵ Similarly, Kamal found similar results with Nd: YAG laser and IPL.⁶

IPLs can be used in conditions that are responsive to lasers.⁷ Cheaper and more cost effective as compared to latter it can be a procedure of choice for those patients who can not afford high cost of laser therapy. This study was conducted to determine the efficacy and tolerability of intense pulse light in idiopathic hirsutism.

Objective

To determine the safety and efficacy of intense pulse light in

idiopathic hirsutism

Patients and Methods

It is an on ongoing study of 50 patients and at present 46 have been enrolled. All are females >18 years of age and of Fitzpatrick skin type III and IV, presented at the Department of Dermatology, Mayo Hospital, Lahore. To diagnose any hormonal abnormality, hormonal assays including follicle stimulating hormone, luteinizing hormone, serum testosterone, dehydroepiandrosterone sulphate, serum prolactin and abdominopelvic ultrasonography were done. Patients with underlying hormonal disturbance, polycystic ovary disease, pregnancy, or taking hormonal therapy and women with white hairs were excluded.

After taking informed consent, patient's complete history was taken particularly drug intake, gynaecological and obstetrical problems, fertility history, previous methods of hair removal. Relevant examination was performed. History of wound healing was also inquired to exclude any risk of keloids and hypertrophic scars. Previous modalities used on the sites for hair removal were discontinued.

Immediately before IPL treatment, patient was asked to wash the area with soap and water. Cooling transparent gel was applied to the surface area under treatment. Area was marked with pencil to avoid any overlapping of laser pulses or any skipped areas. Parameters were selected according to Fitzpatrick skin type. Fluence was increased subsequently depending upon the response of the patient but pulse duration was kept constant. All the parameters and findings were noted on Proforma for each patient. They were treated after 4-6 weeks interval.

Patients were given ice pack to cool the area. They were advised to use sun block and to avoid heat and sun light. In case of persistent erythema, mild topical steroid was advised.

After each treatment, patients were evaluated and result graded according to a 4-point scale as excellent > 75% reduction; good 50-75% reduction; fair 25-50% reduction; and poor < 25% reduction in hair density. Digital photographs were taken before and after three months and will be taken after six treatment sessions.

Patients were examined for any immediate side effects e.g. erythema, edema, blistering, necrosis, folliculitis and for late side effects e.g. hypopigmentation, hyperpigmentation, paradoxical hypertrichosis and scarring etc.

Results

The age range of the forty six patients was 18 to 38 years. Mean age was 24.5 years. Fluence range was between 20-40 with a mean of 27.5 J/cm². All patients were Asians with skin type III and IV. As it is an ongoing study, so patients are divided into three groups.

- Group A Who have completed five treatment sessions.
- Group B Who have completed four treatment sessions.
- Group C Who have completed three treatment sessions.

Table 1:

Group	Patients	Excellent n= (%)	Good n= (%)	Fair n= (%)	Poor n= (%)
A	14	4 (28)	6 (43)	4 (28)	0 (0)
B	18	2 (11)	10 (56)	6 (33)	0 (0)
C	14	1 (7)	2 (14)	9 (65)	2 (14)

Table 1 shows the results in the three treatment groups.



Fig. 1a: Before Treatment.



Fig. 1b: After 4 treatment sessions.

Figure 1 (A & B) shows the response in a patient after 4 treatment sessions.

Mild erythema was observed in nearly 80% of the patients and it settled in a few hours. Erythema persisting for more than twelve hours was seen in 16% patients. Folliculitis was seen in 13% of patients. Temporary hyperpigmentation was seen in 10% women which resolved in four to six weeks time.

Discussion

Results of this study using an IPL source for photoepilation show that it is effective in hair removal. Successful hair

removal with this light source has previously been reported in many studies. A preliminary study by Weir and Woo⁸ demonstrated 42% and 37% reduction of hair density using a single treatment in patients with skin types IV and V respectively, with an average fluence of 37 J/cm². Gold *et al*⁹ performed a single-exposure study, with an IPL system. After 12 weeks, a 60% reduction in hair density was noted. Fluences ranged from 34 to 55 J/cm². Another study¹⁰ reported a 75% reduction 12 months after a single treatment in 24 patients with skin types I to VI. In our study, there is > 50% reduction of hair after the first treatment session in 40% of the patients.

In the present study, a mean hair density reduction of >50% was achieved in 71% patients in those who have completed their five treatment sessions. However, Kamal *et al*⁵ used the same light source and performed IPL on the same skin type but showed more than 50% reduction in 92% of their patients after six treatments. Amin *et al*¹¹ reported >50% reduction in all patients after six sessions using IPL and minimal adverse effects were noted. A study done by Feng *et al*¹² in Chinese patients showed that hair reduction was 49.9% after first session, 58.6% after two sessions, 79.3% after three sessions and 80.8% after four sessions.

Patients in our study had the greatest hair reduction after the first treatment session (> 50% reduction in 48% patients) which is nearly similar to Kamal *et al* (> 50% reduction in 55% of patients). However, the study done by Gold *et al*¹⁰ showed more than 75% reduction in his patients but the fluence used in his study was high as compared to our study. Although further treatments in our and other studies led to some increased hair removal but, the added benefit was small. Possibly, the initial flashlamp treatment has sufficient energy to destroy the largest number of anagen follicles during the initial treatment session. Light-induced regression of follicles into the catagen or telogen phase may make these targets less susceptible to subsequent treatments.¹³

Light exposure may lead to four clinical responses. First, heat-induced destruction of the hair shaft does not affect the germinative area and simply result in hair "drop-out," i.e., the hair shaft falls out and next scheduled anagen cycle leads to re-growth of non-affected, terminal hair. In second response, there may be partial injury to the germinative (amplification) zone of the hair follicle along with the hairshaft, resulting in trichoregulatory dysfunction, telogen-shock response, prolonged telogen dropout and eventual re-growth of normal hair once the anagen phase has been reinstated. Third, partial germinative zone injury may lead to the development of dystrophic hairs (thinner and finer in texture, with variable hypopigmentation). Last response ensues long-term photoepilation, which is defined as a reduction in the number of hairs over an interval longer than the normal hair cycle (usually 1-3 months depending on the particular given anatomic region).^{14,15}

As regards the side effect profile, our patients tolerated the treatment very well. Persistent erythema resolved within

2 weeks and similarly other minimal side effects were temporary.

Conclusion

In conclusion, our data document that IPL is safe and effective in inducing hair removal and should be treatment of choice in a developing country like ours.

References

1. Berker DA, Messenger AG, Sinclair RD. Disorder of hair. In: Burns T, Breathnach S, Cox N, Griffiths C, editors. *Rook's Textbook of Dermatology*, 7th ed. Blackwell publishing Ltd, London; 2004: 63.98-63.107.
2. Dierickx C, Alora MB, Jeffery S, Dover MD. A clinical overview of hair removal using lasers and light sources. *Dermatol Clin* 1999; 17: 357-66.
3. Muzaffar F, Akhtar SJ. Light assisted hair removal: facts, expectations and obligations. *J Pak Assoc Dermatol* 2006; 16: 193-5.
4. Rajpar S, lanigan S. The use of lasers for dermatological conditions. *Clin Dermatol* 2007; 35: 473-6.
5. Marrayiannis KB, Vlachos SP, Savva MP, Konotoes PP. Efficacy of long and short pulse alexandrite lasers compared with an intense pulse light source for epilation: a study on 532 sites in 389 patients. *J Cosmet Laser Ther* 2003; 5: 140-5.
6. Kamal T. Long-pulsed Nd: Yag laser and intense pulse light therapy for idiopathic facial hirsutism. A comparative study. *J Pak Assoc Dermatol* 2006; 16: 205-9.
7. Is this laser hair removal or intense pulse light. (cited 2008 16 Oct). Available from: <http://www.laserhairremoval>.
8. Weir VM, Woo TY. Photo-assisted epilation: review and personal observations. *J Cutan Laser Ther* 1999; 1: 135-43.
9. Gold MH, Bell MW, Foster TD, Street S. Long-term epilation using the 'Epilight broad and band intense pulse light hair removal system. *Dermatol Surg* 1997; 23: 909-13.
10. Gold MH, Bell MW, foster TD, Street S. One year follow-up using an intense pulse light source for long-term hair removal. *J Cutan Laser Ther* 1999; 1: 167-71.
11. Amin SP, Goldberg DJ. Clinical comparison of four hair removal lasers and light sources. *J Cosmet Laser Ther* 2006; 8: 65-8.
12. Feng YM, Zhou ZC, Gold MH. Hair removal using a new intense pulse light source in Chinese patients. *J Cosmet Laser Ther* 2009; 11: 94-7.
13. Lask G, Elman M, Statkine M, Waldman A, Rosenberg Z. Laser assisted hair removal by selective photothermolysis preliminary results. *Dermatol Surg* 1997; 23: 737-9.
14. Ross EV, Ladin Z, Kreindel M, Dierickx C. Theoretical consideration in laser hair removal. *Dermatol Clin* 1999; 17: 333-55.
15. Lask G, Eckhouse X, Slatkine M, Waldman A, Kreindel M, Gottfried V. The role of laser and intense light sources in photoepilation: a comparative evaluation. *J Cutan Laser Ther* 1999; 1: 3-13.