

Effectiveness and Safety of Intense Pulsed Light in Hirsutism

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ABSTRACT

Background: Since beauty standards have widely change over the last few decades, women feel self-conscious about having unwanted hair that leads to low self-esteem and some develop depression. Although hirsutism can be emotionally distressing, it can be treated. Females have a lot of pressure to undergo painful procedures of hair removing like plucking, treading and creams that can temporarily remove or reduce the visibility of unwanted facial and body hair. In the past two decades of digital technology, lasers have modernized their use in the treatment of many skin conditions including hirsutism. As intense pulsed light is economical and more cost effective, it can be a more suitable option for those who cannot meet the high expenses of laser treatment.

Objective: To evaluate the efficiency of intense pulsed light in females with hirsutism.

Study Design:

Place and Duration of Study: Department of Dermatology, HIT Hospital Taxila from 1st October 2020 to 30th September 2021.

Methodology: Sixty patients of idiopathic hirsutism more than 15 years of age were enrolled. Both the history and examination were done. Diagnosis of idiopathic hirsutism was made on clinical examination using and necessary investigations. Those who had photosensitivity, hormonal therapy or hormonal disturbance, infertility, white hair hirsute, pregnancy, and history of keloid or hypertrophic scar were excluded from the study. Treatment was given for six sessions, with one month apart. Parameters of IPL were adjusted according to (Fitzpatrick) skin type, the density of hair, and fluency, the fluence will be increased subsequently depending upon the response of the patient. Post treatment, participants were evaluated and a 4-point scale was used to grade the results. Patients were told to revisit after 6 months to assess the regrowth of hair on face.

Conclusion: Intense pulsed light is the cheap, effective and safe option for hirsutism that a third world country like ours needed where the socio-economic status is relatively low.

Keywords: Idiopathic hirsutism, Intense pulsed light (IPL), Fitzpatrick skin type

INTRODUCTION

Hirsutism is a common condition in which female develops an excessive growth of thick, dark hair on the upper lip, chin, chest, abdomen, or back. Androgen are naturally produced in females, however, if a woman's androgen levels are higher than normal, or if her hair follicles are more sensitive to androgens, she may develop hirsutism.¹ Since beauty standards have widely change over the last few decades, women feel self-conscious about having unwanted hair that leads to low self-esteem and some develop depression.² Although hirsutism can be emotionally distressing, it can be treated. Females have a lot of pressure to undergo painful procedures of hair removing like plucking, treading and creams that can temporarily remove or reduce the visibility of unwanted facial and body hair.³

In the past two decades of digital technology, lasers have modernized their use in the treatment of many skin conditions including hirsutism.⁴ Photo epilation, has clear benefits when compared with older, traditional technique if appropriately used. Different lasers have been used for treating hirsutism like Ruby laser, Diode laser, the alexandrite laser and the Nd:YAG laser and Intense Pulse Light (IPL). The diode laser and alexandrite laser have shown better results in treatment of hirsutism in dark skinned patients.⁵

IPL is versatile in using wide range of wavelength. IPL is a system that uses a flash lamp to generate a high-energy pulse of multiple wavelength. Spectral range of IPL is 400 to 1200 nm. This light having a wide spectrum is than subjected to cutoff filters to give specific starting wave length that hits coloured object or structure that matches with the wavelength used, like melanin of hair and hemoglobin in blood. As a result, target is destroyed and heat is produced. This is the same mechanism used in lasers. Lasers can treat only one condition as it uses one wavelength that matches with its target, but on the other hand IPL has a wide range of wavelengths that can be used to treat different conditions by applying various filters.⁶ As light travel through skin, melanin is the

main target in the treatment of hirsutism present in high concentration in hair shaft and follicle.⁷ Once the light strikes the target, it generate heat, destroying the hair-producing papilla.⁸ Heat conversion also occurs in the darker capillaries that bring blood to the follicle. IPL for hair removal, are popular because of the selective hair damage, less time consumption, low cost and fewer side effects.⁶

As IPL is economical and more cost effective, it can be a more suitable option for those who cannot meet the high expenses of laser treatment. So this study was planned to determine the effectiveness, side effects and tolerability of IPL in females with idiopathic hirsutism.

MATERIALS AND METHODS

This prospective study of 60 patients was done at Dermatology Department of HIT Hospital Taxila over a period of 1 year from 1st October 2020 to 30th September 2021. After getting Ethical approval, patients of skin type III and IV who have Idiopathic Hirsutism more than 15 years of age were enrolled. After taking the verbal consent and explaining the purpose of research in Urdu data was collected. The checklist included three parts to collect data regarding demographic information, history, and medical and dermatological examination. Both the history and examination were done by a Dermatologist. Diagnosis of idiopathic hirsutism was made on clinical examination using and necessary investigations. mFG (modified Ferriman-Gallwey) score was used for assessing severity of Hirsutism. Total mFG score range is 0 to 24 and calculated by adding scores for 4 areas of the face. Scoring Key: Normal = less than 8, Mild = 8-16, Moderate = 16-24, Sever = more than 24

Those who had photosensitivity, hormonal therapy or hormonal disturbance, infertility, white hair hirsute, pregnancy, and history of keloid or hypertrophic scar were excluded. Before the procedure hair were trimmed to 1mm and cooling gel was applied over the area. A 610 and 640 nm cut-off filter will be used for Skin

type III and IV respectively. Fluence started at 25 J/cm². Treatment was given for six sessions, with one month apart. Parameters of IPL were adjusted according to (Fitzpatrick) skin type, the density of hair, and fluency, the fluence will be increased subsequently depending upon the response of the patient. Digital photographs were taken before each treatment session. After the procedure, patients were advised to use ice packs, avoid sun exposure and physical sun screen was prescribed. Post treatment, participants were evaluated and a 4-point scale was used to grade the results as excellent (>75%); good (50-75%); fair (25-50%); and poor (<25%) reduction in hair density. All the patients were asked to grade their satisfaction level after procedure as not satisfied, satisfied and very satisfied. Patients were told to revisit after 6 months to assess the regrowth of hair on face.

The data were analyzed by SPSS-22. The collected data were expressed as percentage. Continuous variables were compared by one-way ANOVA. P value ≤0.05 was considered statistically significant.

RESULTS

The age of study participants ranged from 16 years to 50 years with the mean age of 32.7 (SD= 9.9 years). Out of total 51 study participants, family history of hair growth was positive among 27 females (52.9%) and 47.1% (n=24) had no family history of hair growth. Skin type of 78.4% participants (n=40) was III, whereas 21.6% (n=11) had skin type IV (Table 1).

The mean duration of hair growth on involved areas were 5.69±3.34 years ranging from 2-20 years. Regarding overall severity of hair growth on multiple areas involved, more than half of participants have severe hair growth 26 (51%), moderate hair growth severity among 23 (45%) and mild among 2 (3.9%) study participants (Fig. 1).

Regarding response to IPL treatment, excellent response was observed among 58.8% (n=30) participants and 41.2% (n=21) responded good to IPL treatment. Statistically significant association (< .05) was observed between severity and IPL treatment response. Excellent response to IPL treatment was observed among those having severe hair growth (n=20, 77%) [Table 2]. Irrespective of the severity of the hair growth, 57 % (n=29) participants were highly satisfied with IPL treatment. 43.1 % (n=22) were satisfied with IPL treatment (Fig. 2). Study participants were followed for next 6 months for regrowth. Out of total 51 participants, 29 were followed. 35.3 % (n=18) had regrowth of hair and n=11 (21.6%) had no growth (Table 3).

Table 1: Area of hair growth and severity

Area involved	Severity in involved area		
	Mild	Moderate	Severe
Chin	8 (15.7%)	10 (19.6%)	33 (64.7%)
Cheek	25 (49%)	16 (31.4%)	10 (19.6%)
Upper Lip	38 (74.5%)	7 (13.7%)	6 (11.8%)

Tab 2: Association between severity of hair growth and response to hair growth

Variable	Response to IPL treatment		P value
	Good (51-75%)	Excellent (>75%)	
Severity of hair growth			
Mild (5-20 hair)	2	-	.014
Moderate (20-60 hair)	13	10	
Severe (> 60 hair)	6	20	
Satisfaction with IPL			
Satisfied	21	1	.001
Very satisfied	-	29	

Tab 3: Frequency of side effects among study participants

Side Effects	No.	%
Erythema	42	82.0
Perifollicular edema	1	2.0
Erythema and Burn	2	4.0
Erythema & perifollicular edema	3	6.0
Erythema & edema	1	2.0
Burn	1	2.0

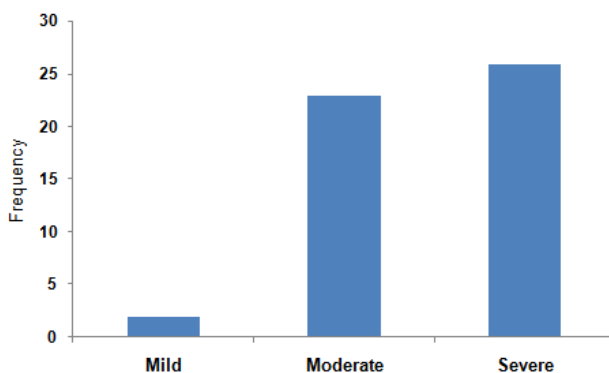


Fig 1: Severity of hair growth on multiple involved areas

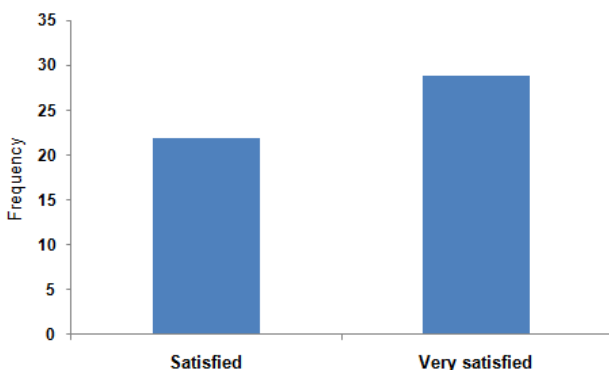


Fig 2: Satisfaction with IPL treatment among study participants

DISCUSSION

Most of the females with hirsutism state feeling unfeminine and nervous due to unwanted hair. These women also have to cover their hair growth and escape social gatherings with others to conceal it. Traditional methods of hair removal are time-consuming and frustrating. It becomes difficult for hirsute women to manage hair removal effectively on regular bases. Successful management plan of a female with hirsutism is multidimensional ranging from physical, medical and psychological aspects.⁹⁻¹¹ Exactly how a woman carries herself and improving this insight are primary components of any management plan. Keeping in view this, we conducted this study to assess the effectiveness of IPL and level of satisfaction among the treated hirsute females. Follow-up are often essential to analyses progress, gauge side effects, and direct further management accordingly, thus cumulative effect on long-term satisfaction.

In our study the age of study participants ranged from 16 years to 50 years and mean age of study participants was 32.7±9.9 Years. A study done in Iraq recorded mean age of participants 33.12±7.76 years which is to our study.¹²

Out of 51 participants 78.4% participants (n=40) had skin type III, whereas 21.6% (n=11) had skin type IV this proportion is the same seen in a study done by Burhan having 70% of females with type III and 7% type IV. However, study done by Khodaeyani and Amimia¹² had 81.7% females with type III and 18.3% type IV.

In our study, more than half of participants have severe hair growth (n=26, 51%), moderate hair growth severity among 45% (n=23) and mild among (n=2, 3.9%) study participants comparable to the study by Khodaeyani and Amimia.¹²

After six complete sessions of IPL treatment in our study, >75% reduction in hair was observed among 58.8% (n=30) participants and 41.2% (n=21), 75-50% reduction in hair was noted. Statistically significant association (<0.05) was observed between severity and IPL treatment response. Excellent response to IPL treatment was observed among those having severe hair growth (n=20, 77%).

In a study by Asad et al¹³, 71% patients showed reduction in hair density >50% after completed their five treatment sessions which is comparable to ours. Similarly, a study by Sadick et al¹⁴ including 34 participants stated hair removal efficacy of 76% after a mean of 3.7 session of IPL. A study done in India revealed 70% patients attained >50% hair reduction (good response) and 15% patients attained >75% hair reduction (excellent response) after 6 sessions.¹⁵ Conversely, using similar light source on the identical skin type after six sessions Saeed et al¹⁰ revealed 92% of their patients more than 50% reduction in hair volume. Another study by Khodaeyani and Amimia¹² 86.42% efficacy of IPL was shown.

Similar results were supported by Asad et al¹³ showed 55% reduction in group A(IPL+ Placebo) and 87.5% in group B(IPL and eflornithine). Likewise, a split face study comparing the efficacy of IPL and Alexandrite was done by Ramani et al¹⁵ stated 79.67% hair reduction with IPL and 42.83% with Alexandrite at sixth session.¹⁶

Irrespective of the severity of the hair growth, 57% (n=29) participants were highly satisfied with IPL treatment.43.1% (n=22) were satisfied with IPL treatment. Similarly, in a study done in Iraq, patients having IPL treatment for hair removal stated considerably higher satisfaction score when compared with Alexandrite at the end of treatment (P=0.0001).

However, a study in Iraq showed 35% of the participants were very satisfied and 45% satisfied and 19% were not satisfied with IPL treatment when compared with Diode laser.⁵ In a study done in India on 40 patients in IPL group, 25% of the patients were very satisfied with IPL hair removal and 70% of the patients were satisfied.¹⁵

Frequency of side effects among study participants 82% was erythema, 6% erythema and perifollicular edema and 4% erythema and burn. Comparable side effects were seen in a study by Husain et al⁸ 87% of the patients experienced pain and erythema. Saeed et al¹⁰ stated 80% of females documented erythema pain and swelling in their study. Similarly, Asad et al¹³ stated erythema in 80%, folliculitis in 13 % and pigmentation in 10%.

Study participants were followed for next 6 months for regrowth. Out of total 51 participants, 29 were followed. 35.3 % (n=18) had regrowth of hair and n=11 (21.6%) had no growth. Neil revealed 92% hair removal efficacy when followed for 30 months.¹⁴

CONCLUSION

Intense pulsed light is the cheap effective and safe option for hirsutism that a third world country like ours needed where the socio-economic status is relatively low.

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