

Intense Pulse Light (IPL) Versus Diode Laser in the Removal of Unwanted Facial Hair

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ABSTRACT

Objective: To compare the efficacies of intense pulse light (IPL) versus diode laser in the removal of unwanted facial hair among female patients.

Study Design: Case series.

Place and Duration of Study: Department of Dermatology, Pak Emirates Military Hospital, Rawalpindi Pakistan, from Jun 2019 to Mar 2020.

Methodology: A total of 38 female patients with hirsutism diagnosed by a consultant dermatologist were included in this study. Intense pulse light therapy was applied on one half of the face while diode laser was used on the other half of the face for three sessions one month apart. A consultant dermatologist assessed the reduction in hair count on both sides of the face after the last session. Any adverse effects experienced by the patients were also recorded.

Results: Out of 38 patients with 76 responses (both sides of the face) were included in the study. 14(17.9%) patients had less than 25% hair reduction, 24(30.7%) had 25-50% reduction, 27(34.6%) had 50-75% and 11(14.1%) had more than 75% reduction of the unwanted hair. Transient erythema 9(11.5%) and moderate pain 9(11.5%) were the common side effects experienced by the patients overall on both sides. Results of the chi-square test revealed that hair reduction, adverse effects and patient satisfaction were not statistically significant in both the groups (p -value>0.05).

Conclusion: This comparative study revealed that intense pulse light and diode laser treatment have been equally efficacious and tolerable in managing unwanted hair among females suffering from hirsutism.

Keywords: Diode laser, Hirsutism laser, Intense pulse light.

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INTRODUCTION

The face has always been a concern for all human beings, particularly the female population.¹ Any pathology arising on the front makes the patient apprehensive, and usually, a quick response is warranted from the treating physician.² Dermatologists, cosmetologists and plastic surgeons have always been on the front line dealing with various pathologies arising on the face in all parts of the world.³

Hirsutism is usually defined as excess terminal hair in a woman that occurs in a male pattern. Females usually report this clinical condition, mostly secondary to some underlying medical pathology.⁴ There could be multiple systemic conditions related to hirsutism, and managing them may decrease the facial growth of hair of affected individuals. Still, mostly local intervention has been required to remove or minimize the unwanted hair on the face.⁵ Various local and systemic therapies have been in practice for this clinical condition.⁶

Various topical modalities have been researched

and used in clinical practice to manage unwanted hairs on the face related to any clinical condition. Neerja Puri, in 2015 compared the intense pulsed light with laser treatment among hirsutism patients. She came up with the conclusion that the diode laser may be the best option for dark-coloured skin. Still, side effects related to this procedure limit its use in patients.⁷ Jo *et al.* 2015 published a paper intending to look for the impact of LPDL in hair removal. Their findings were that this treatment option has been effective with limited side effects.⁸ In 2017, Szima *et al.* performed a study to look for efficacy and adverse effects of Nd: YAG and IPL in hair reduction among hirsutism patients. Their main findings were that there was no statistically significant difference in the efficacy of both treatment options. Patient satisfaction was observed more with IPL treatment and lesser side effects.⁹

People in our part of the world have been equally conscious about their facial beauty and often become too anxious when managed for any facial lesions. Doctors dealing with skin conditions in Pakistan often rely on guidelines based on research conducted in other parts of the world due to limited local data. Rizwan *et al.* studied the treatment of idiopathic facial hirsutism with Medroxyprogesterone Acetate (MPA)

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iontophoresis among patients in Islamabad Pakistan. They concluded that MPA iontophoresis is a safe, effective and well-tolerated therapy in idiopathic facial hirsutism.¹⁰ Limited work has been done on IPL and diode laser for hirsutism in our set-up, so We designed this study to compare the efficacies of intense pulse light (IPL) vs diode laser in the removal of unwanted facial hair at the dermatology department of a teaching hospital of Pakistan.

METHODOLOGY

This case series was conducted at the Department of Dermatology in Pak Emirates Military Hospital, Rawalpindi Pakistan, from June 2019 to March 2020 as treatment was offered to a very limited number of patients, so the study was conducted as a case series and all the cases which were managed with IPL and diode laser were included in the study. The non-probability consecutive sampling technique was used to gather the sample for this study after informed consent. Ethical approval (via letter number A/28/64/20) was taken from the IREB Committee of the hospital.

Inclusion Criteria: Female Patients between the ages of 18 and 55 years, with hirsutism due to any underlying cause diagnosed by a consultant dermatologist were included in the study.

Exclusion Criteria: The patients with the tendency to develop hypertrophic scarring/keloid were excluded. Patients who underwent any treatment for hirsutism in the last year were also excluded. Pregnant and lactating women and patients refusing consent to participate were also excluded from the study. Patients with photosensitivity, pigmentation or any other adverse effects previously with IPL or diode laser or those with white hair were also not included in the study.

All the baseline investigations, including the hormonal profile, were carried out before the start of the study. All the Patients received both forms of the treatment, each on one side of the face. All the patients received IPL on the right side and diode laser treatment on the left side of the face. IPL was performed per standard protocol with a Fluence of 30 J/cm².¹¹ Diode laser was also given per standard practice with a Fluence of 30J/cm², and contact cooling was used.¹² Total three sessions were done one month apart, and hair reduction was measured by counting the number of hair follicles in a 1cm² area on each side of the face before the first session and at the 4th month. The response was recorded by both the patients and an independent dermatologist assessor. Expert categorized

based on reduction in the hair count.¹³ Less than 25%, 25-50%, 50-75%, >75 percent. Patients rated their satisfaction from 0-10 and >6 as sufficient satisfaction for the procedure.¹³ Common side effects recorded were transient erythema, moderate pain (assessed on the visual analogue scale and rated s more than 6), hyperpigmentation, skin irritation, skin burns, and skin hypersensitivity.^{14,15}

Characteristics of participants and the distribution of both sides of the face receiving IPL and diode laser were described using descriptive statistics. In addition, the Chi-square test was applied to determine the correlation between physicians grading of response, patient satisfaction and the presence of adverse effects among both forms of the treatment. All statistical analysis was performed using Statistics Package for Social Sciences version 24.0 (SPSS-24.0). Differences among groups were considered significant if *p*-values were less than or equal to 0.05.

RESULTS

Out of 38 patients and 76 responses (both sides of the face, patients received IPL on the right side and diode laser treatment on the left side of the face) were included in the study. 14(17.9%) patients had less than 25% hair reduction, 24(30.7%) had 25-50% reduction, 27(34.6%) had 50-75% and 11(14.1%) had more than 75% reduction of the unwanted hair. Table-I showed that transient erythema 9(11.5%) and moderate pain 9(11.5%) were the common side effects experienced by the patients.

Table-I: Characteristics of Study Participants (n=38)

Characteristics	Frequency (%)
Age (years)	
Mean±SD	27.31±4.662 years
Range (min-max)	18 years - 55 years
Hair Reduction at the end of three Sessions	
<25%	14 (17.9)
25-50%	24 (30.7)
50-75%	27 (34.6)
>75%	11 (14.1)
Common Side Effects	
Transient Erythema	09 (11.5)
Photosensitivity	02 (2.6)
Hyperpigmentation	04 (5.2)
Moderate Pain	09 (11.5)
Skin Burns	02 (2.6)
Others	01 (1.3)

Table-II showed that hair reduction, adverse effects and patient satisfaction were not different statistically in both the groups (*p*-value>0.05), stating that both the methods are equal in efficacy and tolerability.

Table-II: Outcome of various Variables Studied in the final Analysis (n=38)

Factors Studied	Intense Pulse Light n(%)	Diode Lasern (%)	p-value
Hair Reduction			
<25%	10 (26.3)	04 (10.5)	0.149
25-50%	09 (23.6)	15 (39.5)	
50-75%	12 (31.6)	15 (39.5)	
>75%	07 (18.4)	04 (10.5)	
Patients Response			
Not Satisfactory	19 (50.0)	12 (31.6)	0.101
Satisfactory	19 (50.0)	26 (68.4)	
Presence of any Adverse Effect			
No	28 (73.7)	21 (55.3)	0.092
Yes	10 (26.3)	17(44.7)	

DISCUSSION

Hirsutism has been one of the most stressful conditions for women, especially of the younger age group. It can occur as part of multiple metabolic or endocrine syndromes and sometimes may be idiopathic. Behboodi Moghadam *et al.* in 2018 conducted a detailed review. They concluded that no matter the tool used, overall quality of life had been affected in several ways if the patient has been suffering from a condition which gives rise to unwanted hair on the face.¹⁶ Alizadeh *et al.* 2017 conducted an interesting study on this regard. Instead of reducing hair growth as the outcome, they studied the overall quality of life after the laser treatment of hirsutism. They concluded that laser therapy improves hirsutism and enhances the quality of life in such women.¹⁷ Multiple treatment options have been available for managing hirsutism. Still, the evidence is little for the best choice for our population. Therefore, we planned this study to compare the efficacies of intense pulse light (IPL) versus diode laser in removing unwanted facial hair at the Dermatology Department of a teaching hospital in Pakistan.

Shrimal *et al.* in 2017 concluded that long-pulsed Nd: YAG Laser (1064 nm) is better than IPL-755 nm in terms of safety and effectiveness in the management of idiopathic facial hirsutism.¹⁸ Though our study was a bit different. Still, we compared a form of laser therapy with IPL. We concluded that intense pulse light and diode laser treatment have been equally efficacious and tolerable in managing unwanted hair among females suffering from hirsutism. Further studies with more sample size may clear this phenomenon more.

In 2011, Nilforoushzadeh *et al.* conducted a trial and compared the Diode and Alexandrite Lasers Versus Alexandrite Laser Alone to manage hirsutism.

They came up with the findings that overall efficacy and patient satisfaction were not statistically significantly different in both groups.¹⁹ Though we compared diode laser with IPL, our results were that they were equally effective and tolerable among the patients presenting with hirsutism.

Transient erythema and pain were the common adverse effect seen in our patients, and they were equally distributed between the two groups. Thaysen-Petersen *et al.*¹⁴ in 2017 and Zaleska *et al.*¹⁵ in 2018 also summarized that common adverse effects of laser and IPL treatment include transient erythema, mild to moderate local pain, hyperpigmentation, skin irritation, skin burns, and skin hypersensitivity.

Goh *et al.* in 2003 investigated the safety and effectiveness of a long-pulsed Nd: YAG (1064nm) laser compared to a shorter wavelength intense pulse light system for assisted hair removal in volunteers with various skin types. They concluded that long pulse width of 1064 nm Nd: YAG laser, which can penetrate five to seven millimetres into the dermis depths to reach the whole length of the hair follicle, would be expected to produce sufficient follicular injury with less epidermal damage in patients with darker skin type compared to shorter wavelength laser and light system giving better results in this regard.²⁰ We studied response after the three sessions on two sides of the face with each modality and found no statistically significant difference on both the sides.

LIMITATIONS OF STUDY

This study has a few limitations as well. More sophisticated methods or patient satisfaction questionnaires may have yielded better and more reliable results. The sample size was also small, hindering the generalizability of this trial to the local population. Adequate blinding and addressing other limitations in future studies may generate better results.

CONCLUSION

This study revealed that intense pulse light and diode laser treatment have been equally efficacious and tolerable in managing unwanted hair among women suffering from hirsutism.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SO: Conception, study design, critical review, drafting the manuscript, approval of the final version to be published.

NI: Data analysis, data interpretation, critical review, approval of the final version to be published.

ZZ & AA: Data acquisition, Critical review, approval of the final version to be published.

KA & MM: Drafting the manuscript, data interpretation, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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