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Original Research Article

Intense pulsed light for the treatment of hirsutism

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ABSTRACT

Background: Hirsutism can represent a severe cosmetic disturbance, sometimes with psychological implications. Various lasers and broadband light sources have been developed for treatment of hirsutism. The objective of this study was to know the efficacy of IPL in hirsutism patients
Methods: Forty patients were included in the study. Treatment parameters in respect of pulse duration and fluence were determined according to manufacturer's recommendation. Hair removal efficiency was calculated as a percentage of the number of hairs present at each visit compared with baseline count.
Results: Most of the patients were of the skin type 4 and type 5. More number of patients had hair growth over the chin and sides. Among 40 patients, 70% of patients had good response and 15% of patients had an excellent response. Minimal side effects only noted.
Conclusions: IPL is safe and efficient modality for treatment of hirsutism.

Keywords: Hirsutism, IPL, Chromophore

INTRODUCTION

Hirsutism, a hair disorder of women of childbearing age, is of late become a not so uncommon problem, occurring in as much as 5-11% of them. It manifests as excessive terminal hair growth in the androgen sensitive areas. The severity is more of a subjective perception and occurs over a wide range.[1,2] The medical management of hirsutism aims at rectifying the underlying hormonal imbalance if any. But the downside of the medical treatment is that, it works just as long as it is given and also it does not attend to the unwanted hairs over the non androgen-dependent sites.[3] There are many number of temporary depilatory methods like shaving, waxing, depilatory creams and tweezing to name a few. Though these are convenient and inexpensive, they come with their own share of disadvantages like requiring high maintenance and causing folliculitis and irritation. Electrolysis though, is a permanent treatment modality, is a painful and time-consuming procedure with a potential threat of scarring. This being the scenario, novel approaches like Laser and IPL come in handy for long-term epilation of unwanted hair. They give permanent hair removal in some cases and prolonged delay with sustained hair count reduction in a lot more.[4] The concept being selective photothermolysis. With this background, we conducted a study to assess the efficacy of IPL in hirsutism.

METHODS

Patients who were willing for hair removal procedure were included in the study during the period of two years from February 2012 to February 2014 at Madras Medical College. Those patients with keloidal tendency, systemic associations, grey hair and pregnancy were excluded.

Duration of treatment, potential adverse effects and post treatment care were explained to the patients. Written consent was obtained. Treatment parameters in respect of pulse duration and fluence were determined according to manufacturer's recommendation. One cm square area grid on the treatment site was used to count hair at baseline and at subsequent intervals (0, 4, 8, 12, 20, 24 weeks). Hair over the treatment site was shaved on the day of procedure.

Cooling gel was applied over the area before the procedure. 640 nm cut-off filter is used. Fluence started from 20 J/cm^2. Pulse duration maintained in 3 ms. Treatment was given for 6 sittings at a gap of 4 weeks.

Study was approved by ethical committee. Digital photographs were taken before each treatment session. After the procedure, patients were advised to avoid sun exposure and physical sun screen was prescribed. Hair removal efficiency was calculated as a percentage of the number of hairs present at each visit compared with baseline count and was graded as mild (0–25%), moderate (26–50%), good (51-75%) and excellent (76-100%). The collected data were expressed as percentage. Continuous variables were compared by one way ANOVA. P≤0.05 was considered statistically significant. All the patients were asked to grade their satisfaction level after procedure as not satisfied, satisfied and very satisfied.

RESULTS

Forty patients were included in the study. Large number patients (75%) were below 35 years and were worried about their physical appearance. More number (55%) of patients were students. Skin types of study patients shown in Table 1. Most of the patients (90%) were in skin type 4 and type 5. In our study 22 patients (55%) had PCOS.

Table 1: Skin types of study patients.

Skin type	No. of patients
3	4
4	20
5	16

Table 2: Areas of treatment in study patients.

Site	No. of patients
Upper lip	6
Upper lip & chin	2
Upper lip, chin & sides	6
Chin & sides	26

Treated areas are listed in Table 2. More number of patients had hair growth over the chin and sides.. Hair removal efficiency was graded as mild (0–25%), moderate (26–50%), good (51–75%) and excellent (76-100%) tabulated in Table 3. Among 40 patients, 70% of patients had good response and 15% of patients had an excellent response.

Table 3: Hair removal efficiency (HRE) in the study population.

Improvement	Frequency	Percentage (%)
Mild	0	0
Moderate	6	15
Good	28	70
Excellent	6	15

Table 4: Treatment sessions in the study patients who had good response.

No. of sessions	No. of patients	Percentage (%)
4	18	45
5	12	30
6	8	20

Number of sessions required to give good response is tabulated in Table 4. Oneway ANOVA used to find the maximum improvement between settings which is tabulated in Table 5. Most of the patients responded after 4 sittings. This is statically significant.

Table 5: One way ANOVA to find the maximum improvement between sittings.

Sittings	No. of patients	Mean HRE (%)	S.D	P value
3	40	43.30	11.904	<0.001
4	40	53.75	8.932	
5	40	50.05	10.154	
6	40	60.85	10.236	

Table 6: Mean HRE in different skin types.

Skin type	No. of patients	Mean HRE (%)	S.D	P value
3	4	67	12.727	0.683
4	20	59.8	10.559	
5	16	60.6	10.266	

Table 7: Independent samples t-test to compare the mean improvement between PCOD and non PCOD patients.

	N	Mean HRE (%)	S.D	P value
Without PCOD	18	59.67	9.605	0.653
With PCOD	22	61.82	11.089	

Mean hair removal efficiency of intense pulsed light is shown in Table 6. Hair removal efficiency of IPL was almost equal in the different skin types of our study patients. Independent samples t-test is used to compare

the mean improvement between PCOD and non PCOD patients (Table 7). No difference in hair removal efficacy noted in between PCOD and non PCOD patients.

Table 8: Patient satisfaction for hair removal

Satisfaction levels	No. of patients	Percentage (%)
Not satisfied	2	5
Satisfied	28	70
Very satisfied	10	25

Among 40 patients in the IPL group, 70% of the patients were satisfied and 25% of the patients were very satisfied with IPL hair removal (Table 8).

Table 9: Side effects noted in our study.

Side effects	No. of patients	Percentage (%)
Erythema	28	70
Perifollicular edema	18	45

Mild erythema was noted in 70% of our patients immediately after procedure. No scarring or blistering noted in our study (Table 9). After 6 months, 22 patients came for follow up. Among them, 20 patients maintained their achieved hair removal. But 2 patients developed mild regrowth.

Figure 1: (A) Before and (B) after picture of patient 1.

Figure 2: (A) Before and (B) after picture of patient 2.

Figure 3: (A) Before and (B) after picture of patient 3.

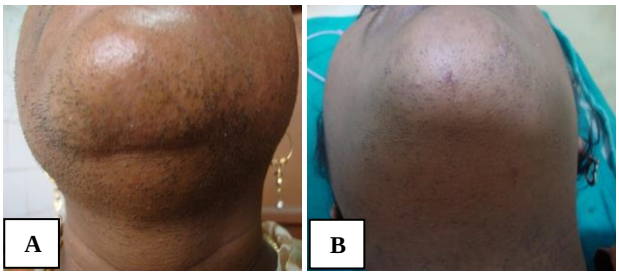

Figure 4: (A) Before and (B) after picture of patient 4.

Figure 5: (A) Before and (B) after picture of patient 5.

Figure 6: (A) Before and (B) after picture of patient 6.

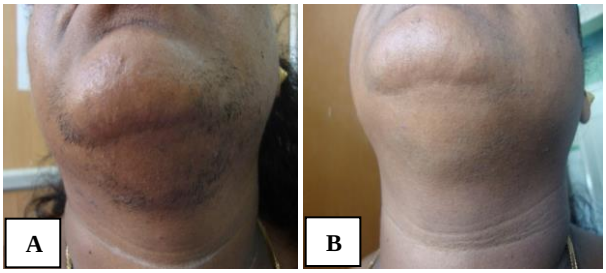

Figure 7: (A) Before and (B) after picture of patient 7.

Figure 8: (A) Before and (B) after picture of patient 8.

Some of the patients before and after IPL treatment pictures shown (Figure 1-8).

DISCUSSION

Hirsutism is a frequent reason for cosmetic embarrassment, poor self esteem and psychological distress for women world over. Hair removal methods include shaving, waxing, threading, use of tweezers, depilatory creams, electrolysis and laser epilation.[5] Laser hair removal systems are grouped into three categories, depending on their wavelength and type of light source:[6]

1. Red light lasers (Ruby laser – 694 nm)
2. Infra red lasers (Alexandrite laser – 755 nm; Diode laser – 800 nm, Nd : YAG laser – 1064 nm)
3. Intense – pulsed light (IPL) source (550-1200 nm) with appropriate filters.[7]

All systems are able to temporarily interrupt hair growth, however, permanent reduction of hair density is mainly based on the number of sessions, fluence and intensity of the hair color. Blond, red and white hairs are not suited for laser epilation, whereas dark hair on fair skin is the optimal target. Depending on the different published studies this can vary between 10–40%. Light assisted hair removal is based on the theory of selective photothermolysis which predicts that thermal injury will be restricted to a hair follicle if the pulse duration is shorter than the cooling time or thermal relaxation time of the follicle.[8] Selective absorption of hair chromophores result in destruction of hair follicles without destroying adjacent tissues.[9]

Multiple treatments are necessary due to the nature of the hair growth cycle.[10] In IPL, by placing appropriate filters on the light source, wavelengths ranging from 590 to 1200 nm can be generated. Cut-off filters are used to eliminate short wavelengths, so that only the longer, more deeply penetrating wavelengths are emitted. Pulse durations vary in the millisecond domain. A single or multiple pulse (2-5), with various pulse delay intervals, can be chosen. The wide choice of wavelengths, pulse duration and delay intervals make the device potentially effective for a wide range of skin types.

Forty patients, in the age group between 18 and 45 years, were given IPL treatment. Among them, 22 patients had polycystic ovarian disease.

Skin type

Most of our patients had skin type IV and V. There was no change in the efficacy of IPL in the different skin types. This is supported by Ismail et al and Khodaeyani et al.[11,12]

Sittings

Forty five percentage of patients achieved maximum result after 4 sittings. This finding was observed by Maya et al.[13] In her study, IPL was given for type IV and V skin patients and maximum result was achieved after 4 sittings.

Hair removal efficacy

In this study 70% patients showed good response (>50% hair reduction) and 15% patients showed excellent response (>75% hair reduction) at the end of 6 sittings. This feature was also noted by Kamal et al.[14] He found excellent response in 30% of cases and good response in 62% of cases after same period.

Efficacy in PCOD and nonPCOD groups

There was no difference in hair reduction between PCOD patients and non PCOD patients in this study which is also supported by Taylor et al.[15]

Satisfaction level

In this study, 70% of our patients in IPL group were satisfied and 25% patients were very satisfied. According to Fodor et al, only 60% patients rated their satisfaction to be good.[16]

Side effects

Mild erythema and perifollicular edema were the side effects noted in our study. Jay et al showed minimal side effects (temporary skin lightening or darkening in 3 patients, acne-like rashes in 6 patients and slight tingling sensations or sensitivity in 2 patients) in 250 hirsutism patients.[17]

Follow up

After 6 months, only 22 cases came for follow up. 18 patients maintained their results. But 4 patients developed regrowth of hair. Troilium et al showed long lasting hair reduction in all cases.[18]

CONCLUSION

Good to excellent hair removal was obtained in 85% of patients. IPL is a safe and efficient modality for removing facial hairs. The key benefit of IPL system is its cost-effectiveness. Larger treatment areas can be easily treated because of larger spot size.

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Ethical approval: The study was approved by the institutional ethics committee

REFERENCES

1. Hughes CL. Hirsutism. In: Olsen EA, ed. Disorders of Hair Growth. McGraw-Hill, New York; 2003: 431–452.
2. Messenger AG, de Berker DAR, Sinclair RD. Disorders of Hair. Rook's Textbook of Dermatology, eighth edition. Wiley Online Library; 2010: 66.80-66.89.
3. Olsen EA. Methods of hair removal. J Am Acad Dermatol. 1999;40:143-55.
4. Bencini PL, Luci A, Galimbeti M, Ferrant G. Long-term epilation with long-pulsed neodimium:YAG laser. Dermatol Surg. 1999;25:175-8.
5. Wheeland RG. Laser-assisted hair removal. Dermatol Clin. 1997;15:469-77.
6. Stratigos AJ, Jeffrey S. Dover and Harry Moseley. Laser hair removal. Photo Dermatology, third edition: 25;156-7.
7. Sadick NS, Weiss RA, Shea CR, Nagel H, Nicholson J, Prieto VG. Long term photoepilation using a broad spectrum intense pulsed light source. Arch Derm. 2000;136:1336-40.
8. Anderson RR, Parrish JA. Selective photothermolysis: precise microsurgery selective absorption of pulsed radiation. Science. 1983;220:524-7.
9. Sanchez LA, Perez M, Azziz R. Laser hair reduction in the hirsute patient: a critical assessment. Hu. Reprod. Update. 2002;8:169-81.
10. Lask G, Eckhpuse S, Slatkine M, Waldman A, Kreindel M, Gottfried V. The role of laser and intense light sources in photo epilation: A comparative evaluation. J Cutan Laser Ther. 1999;1:3-13.
11. Ismail SA. Long- Pulsed Nd: YAG laser versus IPL for hair removal in dark skin. Br J Dermatol. 2011;10:1365–2133.
12. Khodaeyani E, Amirnia M, Babaye S, Alikash NH, Brufeh B. Efficacy of Intense Pulsed Light in Hirsutism. Pakistan Journal of Biological Sciences 2010;13(13):635-41.
13. Vedamurthy M. Use of Intense Pulsed Light (IPL) in Indian Skin Types Presented at the 27th American Society for Laser Medicine and Surgery (ASLMS) Annual Conference in Grapevine, Texas, 2007.
14. Kamal T. Nd: YAG laser and intense pulse light therapy for idiopathic facial hirsutism. A comparative study J Pakistan Assoc Dermatologists. 2006;16:205-9.
15. Taylor M, Gonzalez M. Hyperandrogenism does not predispose patients to photoepilatory treatment failure: a single-center review. J Cosmet Dermatol. 2010;9(3):169-73.
16. Fodor L, Menachem M, Ramon Y, Shoshani O, Rissin Y, Eldor L, et al. Hair removal using intense pulsed light (EpiLight): patient satisfaction, our experience, and literature review. Ann Plast Surg. 2005;54(1):8-14.
17. Jay H. IPL hair removal safety in 250 patients. Cosmetic Dermatology. 2002:15.
18. Troilius A, Troilius C. Hair removal with a second generation broad spectrum intense pulsed light source - A long-term follow-up. J Cutaneous Laser Therap. 1999;1:173-8.

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