

Original Article

Long-pulsed Nd:YAG laser and intense pulse light therapy for idiopathic facial hirsutism. A comparative study

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Abstract *Background* Lasers including Nd:YAG and intense pulse light are increasingly being used for the treatment of facial hirsutism.

Objective The purpose of the study was to compare the efficacy and safety of long-pulsed Nd:YAG laser and IPL in the treatment of idiopathic facial hirsutism.

Patients and methods 100 patients of idiopathic facial hirsutism were included in the study. 50 were treated with long-pulsed Nd:YAG laser (group A) and 50 were treated with IPL (group B). The starting fluence and pulse duration were determined according to the skin type. They were treated at 4-6 weeks interval for six treatments. The two groups were compared for efficacy and safety at the end of treatment. Efficacy was graded according to a 4-point scale from excellent to poor.

Results At the end of six treatments 20% of patients in group A and 30% in group B exhibited excellent i.e. >75% hair reduction whereas 58% and 62% patients in groups A and B, respectively showed fair improvement i.e. 50-75% hair reduction. The two groups did not differ in terms of side effects. Immediate perifollicular erythema and edema were immediate side effects in both groups. Transient post-inflammatory pigmentation was observed in 45% and 60% of patients in groups A and B, respectively.

Conclusion Long-pulsed Nd:YAG laser and IPL both are effective and safe methods for the treatment of idiopathic facial hirsutism.

Key words

Hirsutism, Nd:YAG laser, intense pulse light.

Introduction

Unwanted facial and body hair can represent a severe cosmetic disturbance, sometimes with social and even psychological implications. For this reason many patients both men and women use different methods of epilation to decrease the hair density.

Until now several methods have been used to remove these unwanted hairs such as waxing, threading, plucking, shaving and electrolysis etc.¹ But Asian skin is prone to get post-inflammatory hyperpigmentation, thus limiting the selection of methods of epilation.

In the recent years, various lasers and broadband light sources have been developed for long term epilation of unwanted hair, which is a feature of hirsutism.¹⁻⁷

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This study was carried out to compare the efficacy and safety of long-pulsed Nd:YAG laser and intense pulse light (IPL) in patients with hirsutism.

Patients and methods

Total 100 patients were enrolled in the study. All were females of ages between 18 to 40 years who presented at the department of dermatology, Jinnah Hospital, Lahore and a private skin and cosmetic laser center. All patients were treated for a period of one year. Hormonal assays including follicle stimulating hormone (FSH), luteinizing hormone, serum testosterone and androstenedione, dehydroepiandrosterone sulphate (DHEAS), serum prolactin and serum fasting insulin, and abdominopelvic ultrasonography were done to diagnose any hormonal abnormality. Patients with underlying hormonal disturbance or polycystic ovary disease; pregnancy; postmenopausal women with white hair were excluded. Eligible patients were randomly divided in two groups. Group A: 50 patients treated with long-pulsed Nd:YAG laser; and group B: 50 patients treated with intense pulse light (IPL).

After taking informed consent, patients' complete history and relevant examination findings were recorded. In the history the features particularly inquired about were age of onset, duration of hirsutism, family history of disease, drug history, hormonal therapy, any gynecological/obstetric problem, fertility history and previous methods of hair removal. History of wound healing was also inquired to exclude any risk of keloids and hypertrophic scars.

Patients received treatment on selected body areas of face (chin, lips, whole face and neck).

Skin patch test Patch test was performed to select the parameters for the treatment and safety profile of the patients. It was done 2 to 3 days before the session and on a less sun exposed site.

Laser sessions At the time of laser session the patient was asked to wash her face with soap and water to remove any make up or powder. Topical lidocaine was applied on the treatment area in a few patients on request. Later the area was marked with a pencil to avoid any overlapping of laser pulses or any skipped areas. Parameters were selected according to the patient's Fitzpatrick skin type, hair diameter and results of the patch test.³ The usual starting fluence and pulse duration in both treatment groups are shown in **Table 1**. In each group subsequently the fluence was increased by 15% but pulse duration was kept constant. Continuous chilled air flow was delivered during the procedure to provide maximum epidermal cooling and to make treatment painless for the patient. The time required for the procedure depended on the area of the treatment. All the findings and parameters were noted on the printed pro forma for each patient either with Nd:YAG or IPL. Patients were retreated after 6-8 weeks for a total of six treatments.

Postlaser care If any perifollicular edema or deep erythema was present then a combination of antibiotic and hydrocortisone cream was applied. Patient was given ice pack to further cool the area.

Table 1 Treatment parameters used in both groups.

	Fluence (J/cm^2)		Pulse duration (milliseconds)	
	Group A (Nd:YAG laser)	Group B (IPL)	Group A (Nd:YAG laser)	Group B (IPL)
Fine, light hair	45-70	30-38	20-25	20-25
All types of dark hair	40-60	25-35	30-40	25-30

Patients were advised strict sun and heat avoidance to prevent any pigmentary problems and also to use sun block of SPF 60 for the rest of the days.

Follow up

Patients were followed up for a period of two months to see any hair regrowth and pigmentary changes. All patients were advised postlaser skin care.

Efficacy

After each treatment and then at the end of six treatments, 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 taken before and after three months and six months of treatments were also compared.

Safety and side effects

Patients were examined for any immediate side effects e.g. erythema, edema, necrosis etc. and late side effects e.g. hypo- and hyperpigmentation, scarring etc.

Results

The age range of the study population was 18 to 40 years. Average age of onset of hirsutism was 29.5 years. All patients were Asians with skin type III and IV. 70% of the patients had the history of hirsutism in close family members. None of the patients was on any kind of hormonal therapy. Before entering into the study, 80% of patients were

Table 2 Areas of treatment in two groups.

Area	Group A n (%)	Group B n (%)
Upper lip	5 (10)	3 (6)
Upper lip and chin	10 (20)	12 (24)
Whole face	30 (60)	35 (70)
Whole face with neck	5 (10)	None

Table 3 Comparison of efficacy (% improvement) in two groups.

End of session	Group A NDYAG laser	Group B IPL
1 st	38% fair 50% good 12% poor	45% fair 55% good poor none
2 nd	60% fair 25% good 15% poor	58% fair 30% good 12% poor
5 th	50% fair 30% good 20% poor	46% fair 38% good 14% poor
6 th	20% excellent 58% good 15% fair 7% poor	30% excellent 62% good 8% fair - none

doing threading, 40% were bleaching, 40% were waxing and 20% of patients had not used any cosmetic remedy for their hirsutism.

Area of treatment

Majority i.e. 90% of patients had treatment done on face (chin, upper lips and sides) as shown in **Table 2**. 10% of patients had laser done on their neck.

Efficacy

Table 3 shows the results in the two treatment groups. After six sessions, 78%

Table 4 Side effects seen in two groups.

<i>Side effects</i>	<i>Mild to moderate</i>		<i>Severe</i>	
	<i>Group A</i>	<i>Group B</i>	<i>Group A</i>	<i>Group B</i>
Erythema	60%	70%	15%	25%
Perifollicular edema	50%	40%	0%	2%
Crusting	30%	40%	None	15%
Scars	2%	3%	0%	0%
Hyperpigmentation	45%	60%	0%	0%

patients in group A and 92% patients in group B showed >50% hair reduction. A side by side improvement in aesthetic appearance was also seen.

Safety and side effects

Table 4 shows the side effects observed in two groups. Mild to moderate erythema was observed in 60% cases in group A and 70% in group B. Severe erythema lasting more than 12 hours was observed in 15% cases of group A and 25% cases of group B. Mild to moderate perifollicular edema developed in 50% cases in group A and 40% cases in group B. Severe perifollicular edema was seen in just 2% cases of group B. Crusting was only mild to moderate which shed off in 3-4 days. In 30% cases in group A patient and 40% in group B, moderate crusting was noticed. Mild scars were present in just 2% cases in group A and 3% in group B. Hyperpigmentation was quite commonly observed in type IV skin. It was observed in 45% patients of group A and 60% cases of group B. The hyperpigmentation was mild to moderate and mostly resolved in 10-14 days time.

Discussion

About 5-10% of all women of child bearing age and one-third of all post-menopausal women display some degree of hirsutism. Increased hair growth (unwanted hair growth) has strong negative psychological

effect on the well being of the women.⁴ For this reason various methods of hair removal have been practiced. Now with the introduction of lasers for hair removal, there have been remarkable advances in this technology with different types of lasers in the market.⁵ Every laser system has some advantages and disadvantages regarding reduction of hairs, side effects, compliance etc. In past few years long-pulsed Nd:YAG laser, 1064 nm wavelength, has emerged as an effective hair removal system with lesser side effects.⁶ Intense pulsed light technology is also the perfect complement to lasers, employing a broad spectrum of light energy, a range of wavelengths. IPL supplies high levels of light power in millisecond burst.⁷

IPL devices also offer sophisticated, computer driven precision and tremendous versatility, the key benefit of IPL system is its cost-effectiveness. Larger treatment areas can be easily treated because of larger spot size. With IPL the chances of mild blistering and pigmentation, are little higher than other types of laser hair removal lasers. In the present study, efficacy and safety of long-pulsed Nd:YAG laser was compared with IPL in the treatment of idiopathic facial hirsutism.

Group A patients were started on 40 joules/cm² fluence with 30 milliseconds pulse duration. Group B patients were treated with fluence of 25 J/cm² with 20 milliseconds

pulse duration. Digital photographs were taken before, at 3rd session, and at 6th session. The first session showed significant hair reduction of about 38% in 60% of patients enrolled in group A whereas 70% of group B patients showed 45% reduction. At the end of sixth session, group A had excellent response in 20% of patients and good in 58% whereas group B had excellent response in 30% and good response in 62% of patients. Statistically speaking, there was no difference between two groups. The results of present study are in accordance with the previous data.⁶⁻¹⁰

Side effects were noted in both groups i.e. mild to moderate erythema in 60% of group A patients and 70% in group B. Severe erythema which lasted for more than 12 hours was observed in 15% cases of group A and 25% cases of group B mostly after second session of laser in both groups.⁸ Crusting was mild to moderate in Group A but almost 15% in Group B had even severe Crusting lasted more than a week, healing with pigmentation. Hyperpigmentation alone was observed in 45% patients of group A and 60% cases of group B. Side effects profile was also similar in two groups and was consistent with earlier data.^{11,12}

Conclusion

Both long-pulsed Nd:YAG laser and IPL are effective modes for hair removal. Though statistically insignificant, more side effects were noted with IPL than with long-pulsed Nd:YAG.⁹ However, in experienced hands this therapy is cheaper and more cost-effective.

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