

Role of low fluence Q-Switched laser in the treatment of hyper pigmented skin disorders

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Abstract

Objective To determine the efficacy and safety of Q-Switched Nd-YAG laser in the treatment of various pigmentary cutaneous disorders.

Methods This study was carried out at Department of Dermatology Shaheed Mohtarma Benazir Bhutto Skin Complex Larkana from May 2017 to November 2017. A total of 40 patients, who fulfilled the inclusion criteria (who failed the conventional treatment) were enrolled for this study after taking informed consent. The diagnosis of all cases was made on clinical basis. Spot sizes vary from 3cm to 20cm were treated with Q-switched laser on weekly basis. The result of pigmentation was assessed initially after 3 sessions followed by every week session with grading and photographs. Adverse effects were recorded after each visit.

Results A total of 40 cases participated, 27 (67.5%) out of 40 were of melasma, 11 (27.5%) were of Nevus of ota and 2 (5%) were of Tattoo Marks. Out of 27 (67.5%) cases of melasma 5 (18.5%) showed minimum hyper pigmentation as before treatment with Nd YAG Laser were graded as severe hyper pigmentation, 7 (27.9%) showed moderate hyper pigmentation and 15 (55.5%) cases didn't gave any response and discontinued the treatment. Out of 11 (27.5%) cases of Nevus of ota 8 (27.7%) showed marked improvement and 3 (27.2%) showed moderate improvement. The 2 cases of Tattoo Marks gave good response and were males. The treatment response was statistically significant ($p=0.92$) and was statistically no significant gender difference ($p=.819$).

Conclusion we conclude that Q-Switched Nd YAG laser is good modality to treat various pigmentary skin disorders in which conventional treatment is less satisfactory.

Key words

Q-Switched Nd YAG Laser, Melasma, Nevus of ota.

Introduction

Melasma is an acquired pigmentary disorder presenting as hyper pigmented light to dark brown patches on the face, most commonly seen in females. The major etiological factors included are exposure to ultraviolet (UV) radiations, sex hormones, drugs like oral

contraceptive pills, genetic influences etc. although the exact pathogenesis of Melasma is not fully elaborated.¹

The pathophysiology of melasma is believed to involve excess production of melanin or an increase number of melanocytes in the skin. Laser using low fluence Q-Switched Nd YAG has been an effective treatment option in our population.¹ Recent studies have shown that interactions between the altered cutaneous vasculature and melanocytes have influences on hyper pigmentation development in melasma, which demonstrated that greater vascularity is

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one of the major finding.²

Nevus of ota (oculodermal melanocytosis) is a dermal melanocytic memartoma that presents in childhood or at adolescence as bluish/ slate gray hyper pigmentation along with the first or second branch of trigeminal nerve.⁴ The pigmentation slowly and gradually increases in size and color till puberty. It was first described by Pusey in 1916 in which the patient had both facial and sclera pigmentation. In 1939, the condition was described by the Japanese dermatologist ota and named Nevus of ota, and it was then its clinical description onwards.⁴ Most patients seek treatment early in life or in adolescence but there are as chances of the psychological trauma and cosmetically disfigurement. Treatment options were limited prior to lasers. Q-Switched Nd YAG laser has been used successfully to treat a variety of benign, dermal, pigmented lesions, including Nevus of ota lesion. They have changed the approach in managing this condition and have become the mainstay of the therapy.⁵

Methods

This study was randomized non-controlled study conducted at Department of Dermatology Shaheed Mohtarma Benazir Bhutto Medical University Larkana from May 2017 to November 2017. A total of 40 patients were enrolled who fulfilled the inclusion criteria those were included who already have taken many kind of topical whitening or bleaching agents. Patients having thyroid dysfunction, diabetes mellitus, pregnancy, hormone therapy, oral contraceptives were excluded. Informed consent was taken. The diagnosis was made on clinical basis. Spot size vary from 3-20cm were treated with Q-Switched Nd YAG laser on weekly basis. The result of melasma was assessed by grading such as MASI score and photographs while Nevus of ota was assessed by Quartile

grading scale and photo graphs. Adverse effects were noted after each visit.

Results

A total of 40 cases participated, 27 (67.5%) out of 40 were of melasma, 11 (27.5%) were of Nevus of ota and 2 (5%) were of Tattoo Marks. Out of 27 (67.5%) cases of melasma 5 (18.5%) showed minimum hyper pigmentation as before treatment with Nd YAG Laser were graded as severe hyper pigmentation, 7 (27.9%) showed moderate hyper pigmentation and 15 (55.5%) cases didn't give any response and discontinued the treatment. Out of 11 (27.5%) cases of Nevus of ota 8 (27.7%) showed marked improvement and 3 (27.2%) showed moderate improvement. The 2 cases of Tattoo Marks gave good response and were males. The treatment response was statistically significant (p=0.92) and was statistically no significant gender difference (p=0.819).

Table 1 is showing the (n=40) total no patients with age, sex and disease

Disease	N	Age	Sex
Melasma	27 (67.5%)	18-45 median 42	Females
Nevus of ota	11(27.5%)	20-40 median 20	Females
Tattoo marks	2(5%)	18-30	Males

Table 2 shows grading score for melasma that is MASI score.

Location of melasma	Scoring
Forehead	(0.3)(A)(D)
Left malar	(0.3)(A)(D)
Right malar	(0.3)(A)(D)
Chin	(0.1)(A)(D)
Total	Total

Table 3

Location of melasma	Scoring
Forehead	(0.3)(0)(0)
Left malar	(0.3)(5)(3)=4.5
Right malar	(0.3)(5)(3)=4.5
Chin	(0.1)(0)(0)
Total	9



Figure 1a Melasma before treatment with Q-Switched Nd Yag.



Figure 1b Melasma after treatment with Q-Switched Nd yag.



Figure 2a Nevus of Ota Before treatment of Q-Switch Nd YAG Laser.



Figure 2b Nevus of Ota after treatment with Q-Switch Nd YAG Laser.

Table 4 Grading score for melasma that is MASI score.

Location of melasma	Scoring
Forehead	(0.3)(0)(0)
Left malar	(0.3)(4)(2)=2.4
Right malar	(0.3)(4)(2)=2.4
Chin	(0.1)(0)(0)
Total	4.8

Table 5 Grading score for nevus of ota Quartile Grading score.

Grading	Improvement
Grade 1	<25% indicates minimal improvement
Grade 2	26%-50% indicates moderate improvement
Grade 3	51%-75% indicates marked improvement
Grade 4	>75% indicates near total improvement

Discussion

Melasma is a chronic distressing condition and often therapeutically challenging. Various treatments, including whitening or bleaching agents (e.g. hydroquinone, azelic acid), chemical peels (e.g. Glycolic acid) topical steroids were often unsuccessful. A large spot size low energy mode of the 1064nm Q-Switched Nd YAG is a popular method of melasma therapy in Asian population.¹¹

The pathogenesis of melasma is not completely understood. There are many contributing factors which include genetic influences, exposure to



Figure 3 Tattoo Mark before treatment.



Figure 4 Tattoo Mark after treatment.

UV radiation, female sex hormones, thyroid dysfunction, cosmetics and drugs.¹²

In our study, the MASI score of both sides decreased significantly during the study period. There was no significant difference in the MASI score change between both sides in all periods. Some of patients exhibited a greater improvement and few did not responded to the therapy.

The treatment for Nevus of ota prior to the advent of lasers has been limited. These include

cryotherapy, dermabrasion, surgical excision and cosmetic camouflage. The surgical treatment options were associated with significant scarring and permanent pigment alteration. The Q-Switched lasers have changed the management of pigmentary lesions to a great extent. Of all the Q-Switched lasers available, Q-switched Nd YAG is best suited for Asian skin.¹³

In our study all patients responded well to treatment with (72.7%) patients having more than 75% clinical improvement. We noticed that the therapeutic response was directly proportional to the number of treatment sessions. The side effects were few and all of them were reversible.

Conclusion

We conclude that Q-Switched Nd YAG laser is good modality to treat various pigmentary skin disorders in which conventional treatment is less satisfactory.

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