

Research Article

A study comparing combined Q-Switched Nd: YAG Laser and chemical peeling versus Q-Switched Nd: YAG Laser alone in treatment of melasma

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Abstract

Introduction: Melasma is a common acquired symmetrical hypermelanosis characterized by irregular brown macules of the face and sometimes other sun-exposed areas of the skin. **Aim of the work:** The present study aims to compare the efficacy of 1064-nm QSNYL and MJS peel versus QSNYL laser alone in the treatment of melasma. **Patients and methods:** The present study was conducted on 19 patients with melasma. They were selected from Dermatology Outpatient Clinic of Minia University Hospital during the period from September 2014 till September 2016. **Results:** The present study included 19 cases with mixed type melasma, selected from Dermatology Outpatient Clinic of Minia University Hospital. All of them were females (100%). **Discussion:** Melasma is a symmetric progressive hyperpigmentation of facial skin that occurs in all races, but has a predilection for darker skin phenotypes. Clinically, melasma can be divided into centrofacial, malar and mandibular types according to pigment distribution on the skin. By Wood's light and histopathological examination, melasma can be classified into epidermal, dermal or mixed type, representing the location of melanin pigmentation in skin layers (Grimes, 1995). Meanwhile, the malar and the mixed types of melasma are considered the most common clinical and histopathological variants respectively (Lee et al., 2014). **Conclusion:** low fluence 1064 nm QSNYL with or without MJS peel is equally effective treatment regimens for mixed type melasma in dark skin patients. Meanwhile, improved skin texture and homogenization of skin color were observed with the addition of MJS. Histopathologically, both treatment regimens showed decreased melanin, epidermal melanocytes and dermal melanophages. Meanwhile, the combined treatment regimen is preferred in mixed melasma especially in dark skin patients in the hot climate of our country for avoidance of side effects of repeated multiple laser sessions with decreasing the cost rate of laser sessions.

Key words: CD: Cysteinyl Dihydroxyphenylalanine, Cm²: Square Centimeter, CO₂: Carbon Dioxide

Introduction

Melasma is a common acquired symmetrical hypermelanosis characterized by irregular brown macules of the face and sometimes other sun-exposed areas of the skin. The major etiological factors include genetic influences, exposure to ultraviolet radiation (UVR) and sex hormones. However; the pathogenesis of melasma is not yet fully understood (Bandyopadhyay, 2009). Using wood's light examination, melasma can be classified into epidermal, dermal or mixed type (Sarkar et al., 2012).

Melasma has been studied for years, however, its treatment is met with difficulty (Victor et al., 2004). The treatment of melasma includes

topical formulation, chemical peels, Light Amplification by Stimulated Emission of Radiation (LASER) and light sources. Laser and light therapies represent potentially promising options for melasma patients, who are refractory to other modalities (Geronemus, 2006).

Q-switched Nd-YAG laser (QSNYL) is known to minimize thermal damage by selectively destroying abundant melanin pigment, which is removed by epidermal desquamation. Using superficial chemical peeling (SCP) after laser treatment enhancing the efficacy of laser treatment. Accordingly, the combination therapy was more effective due to deeper penetration depth (Park et al., 2011).

Aim of the work

The present study aims to compare the efficacy of 1064-nm QSNYL and MJS peel versus QSNYL laser alone in the treatment of melasma.

Patients and methods

The present study was conducted on 19 patients with melasma. They were selected from Dermatology Outpatient Clinic of Minia University Hospital during the period from September 2014 till September 2016.

Inclusion Criteria

Female patients with mixed melasma.

Malar type of melasma.**Exclusion Criteria**

Patients with history of hypertrophic scars or keloids.

Patients with recurrent herpes labialis or active herpes infection in the treatment area.

Pregnant and lactating females.

Immuno-compromising diseases (possibility of delayed healing, increased susceptibility to infection or excessive pigmentation after peeling).

Patients with past history of oral retinoid, oral contraceptive pills or systemic steroids within 6 months before starting the study.

Patients with past history of chemical peeling, topical steroids, HQ or bleaching agents 2 months prior to the start of the study.

Results

The present study included 19 cases with mixed type melasma, selected from Dermatology Outpatient Clinic of Minia University Hospital. All of them were females (100%). The age of patients at the time of examination ranged from 30 to 45 years with a mean \pm SD of 37.15 ± 4.88 years. As regard Fitzpatrick skin type, 3 patients (15.8%) were skin type III and 16 patients (84.2%) were skin type IV.

mMASI score before and after treatment on right side of the face

	mMASI score		
	Before	After	Reduction %
Range	2.1-11	0.5-8.6	6.1-79.2
Mean\pmSD	4.9 \pm 2.3	2.8 \pm 2.2	47.5 \pm 22.3
p – value	< 0.001*		

*Significant

mMASI; Modified Melasma Area and Severity Index

SD; Standard Deviation

Discussion

Melasma is a symmetric progressive hyperpigmentation of facial skin that occurs in all races, but has a predilection for darker skin phenotypes. Clinically, melasma can be divided into centrofacial, malar and mandibular types according to pigment distribution on the skin.

By Wood's light and histopathological examination, melasma can be classified into epidermal, dermal or mixed type, representing the location of melanin pigmentation in skin layers (Grimes, 1995). Meanwhile, the malar

and the mixed types of melasma are considered the most common clinical and histopathological variants respectively (Lee et al., 2014).

Treatment of melasma is often quite difficult with unsatisfactory and variable response, despite the availability of several treatment modalities, which include hypopigmenting agents, chemical peels, dermabrasion, laser and light treatments (Lee et al., 2014).

Chemical peeling is a popular method due to the low costs involved and its easy technique

(Wiest, 2003). Meanwhile, it has been reported that repetitive chemical peeling cause adverse

effects, such as irritation, erythema and post-inflammatory hyperpigmentation, especially in dark-skinned patients (Fitzpatrick skin types IV–V) (Sarkar et al., 2012). Accordingly, the choice of peeling agent becomes limited in darker skin types (Lee et al., 2014).

The most frequently used peeling agents for melasma are GA, TCA, salicylic acid and JS (lactic acid, salicylic acid, resorcinol and ethanol), and the reported efficacy of these agents is variable (Gupta et al., 2006; Rendon et al., 2010). Meanwhile, there is a paucity of melasma studies using MJS (El Garem et al., 2014), which has the advantage of avoiding the possible side effects, especially in skin types V and VI (Slavin, 1998; Safoury et al., 2009; El Garem et al., 2014).

In conclusion, low fluence 1064 nm QSNYL with or without MJS peel is equally effective treatment regimens for mixed type melasma in dark skin patients. Meanwhile, improved skin texture and homogenization of skin color were observed with the addition of MJS.

Histopathologically, both treatment regimens showed decreased melanin, epidermal melanocytes and dermal melanophages. Meanwhile, the combined treatment regimen is preferred in mixed melasma especially in dark skin patients in the hot climate of our country for avoidance of side effects of repeated multiple laser sessions with decreasing the cost rate of laser sessions.

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