



RESEARCH ARTICLE

THE TREATMENT OF RIEHL'S MELANOSIS USING DR. HOON HUR'S GOLDEN PARAMETER THERAPY WITH A HIGH FLUENCE 1064NM Q-SWITCHED ND: YAG LASER WITHOUT SIDE EFFECTS

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INTRODUCTION

Riehl's melanosis (RM) is characterized by symmetrical, bilateral, reticulated, dark brown-gray-bluish pigmentation on the face and neck. It is caused by an allergic contact dermatitis to the sensitizing chemicals in cosmetics (Serrano, 1989 and Wang, 2014). The treatment of RM is necessary because of cosmetic concerns. But the treatment of RM without side effects such as purpura, crust, postinflammatory hyperpigmentation (PIH), scarring is very difficult (Smucker, 2014). In this study, we report the new treatment of RM using Dr. HoonHur's GPT with a high fluence 1064nm QSNL without side effects.

REPORT OF CASES

Eleven Korean women patients (age range: 36-58 years old, mean age: 45.8 years old) who were clinically diagnosed with RM (Fig. 1, 3, 5, 7, 9, 12, 15). The patients had no significant medical or familial history. Complete blood count, liver and thyroid function tests were all normal. Serologic tests for antinuclear antibody, rheumatoid factor, anti-smooth muscle antibody and anti-mitochondrial antibody were all negative. After obtaining written informed consent, all of the 11 patients were received 50 treatment sessions of Dr. HoonHur's GPT

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ABSTRACT

Riehl's melanosis (RM) is a pigmented contact dermatitis characterized by reticulated dark brown-gray-bluish pigmentation on the face and neck. Treatment of RM is challenging because there is no golden standard of treatment yet. Therefore, the authors introduce a new treatment of RM using Dr. Hoon Hur's Golden Parameter Therapy (GPT) with a high fluence 1064nm Q-switched Nd: YAG laser (QSNL) without side effects. In this study, Dr. Hoon Hur's GPT with a high fluence 1064nm QSNL proved to be a safe and effective treatment for RM. We suggest that Dr. Hoon Hur's GPT with a high fluence 1064nm QSNL is a new, safe and good option for treating RM.

with a high fluence 1064nm QSNL (Spectra Laser, Lutronic, South Korea) at a one-week interval with a spot size of 7 mm, a fluence of 2.4 J/cm<sup>2</sup> and a pulse rate of 10 Hz with slowly one pass by a sliding-stacking technique over the RM. After the treatment, the entire face was cooled with ice packs, and the patients applied a broad-spectrum sunscreen to the entire face daily throughout the treatment period. The patient was photographed on the day of treatment and 4 weeks after the final treatment. The patients were evaluated with standardized digital photographs using a Canon Camera G11 (Japan). The patients were asked to report immediately if any pain, discomfort, or side effects occurred during treatment. All of the 11 patients with RM were achieved complete pigmentation removal and there were no significant side effects including purpura, crust, PIH and scarring except mild pain during laser treatment (Fig. 2, 4, 6, 8, 10, 13, 16). No recurrences have been detected after a follow-up of 6 months (Fig. 11, 14, 17).

DISCUSSION

Riehl's melanosis (RM) is a non-pruritic pigmented dermatosis and is almost synonymous with pigmented contact dermatitis. Clinically, RM is characterized by symmetrical, bilateral, reticulated, dark brown to gray macules or gray to bluish patches on the face, ears and neck, and is also distributed at the forearms and dorsal hands (Serrano, 1989 and Wang, 2014). RM may not involve ocular or oral mucosa in addition to skin. There is no telangiectasia or skin atrophy.



**Fig.1. Reticulated gray to bluish hyperpigmentation on the face (before treatment)**



**Fig.2. A complete clearance of Riehl's melanosis (after Dr. HoonHur's GPT)**



**Fig.3. Symmetrical, bilateral, reticulated gray to bluish hyperpigmentation on the face (before treatment)**



**Fig.4. A complete clearance of Riehl's melanosis (after Dr. HoonHur'sGPT)**



**Fig.5. Reticulated gray to bluish hyperpigmentation on the face (before treatment)**



**Fig.6. A complete clearance of Riehl's melanosis (after Dr. HoonHur'sGPT)**



**Fig.7. Reticulated gray to bluish hyperpigmentation on the face (before treatment)**



**Fig.8. A complete clearance of Riehl's melanosis (after Dr. HoonHur's GPT)**



**Fig.9. Symmetrical, bilateral, reticulated gray to bluish hyperpigmentation on the face (before treatment)**



**Fig.10. A complete clearance of Riehl's melanosis (after Dr. HoonHur's GPT)**



**Fig.11. There is no recurrence at 6 months' follow-up**

RM is most commonly found in middle-aged women (Serrano, 1989 and Wang, 2014). Histopathologically, RM shows vacuolar degeneration of the basal layer in the epidermis. Prominent pigment incontinence, a few melanophages and a lymphohistiocytic infiltrate are present in the superficial dermis (Wang, 2014). Differential diagnosis should include melasma, Poikiloderma of Civatte and Hori's nevus (Serrano, 1989; Wang, 2014 and Hur, 2017). Melasma discloses symmetrical, bilateral brown diffuse patches on the face instead of gray to bluish patches on the face. Poikiloderma of Civatte reveals telangiectasia, skin atrophy and dyschromatosis including hyperpigmentation and hypopigmentation on the mandibular area, neck and chest.



**Fig.12. Reticulated gray to bluish hyperpigmentation on the face (before treatment)**



**Fig.14. There is no recurrence at 6 months' follow-up**



**Fig.13. A complete clearance of Riehl's melanosis (after Dr. HoonHur's GPT)**



**Fig.15. Reticulated gray to bluish hyperpigmentation on the face (before treatment)**

And Hori's nevus shows multiple brown to gray macules or patches on the face but the hyperpigmentation does not involve the neck(Serrano,1989;Wang,2014 and Hur,2017). RM is a pigmented contact dermatitis or photocontact dermatitis resulting from contact sensitivity related to chemicals, particularly, fragrances including aniline dye(orange II),formaldehyde, geraniol and lemon oil(Serrano,1989). Although the pathogenesis of RM is unknown, some authors think that the sensitizing chemicals in cosmetics produce a type IV cytolytic reaction at the epidermal basal layer and subsequent damage to the basement membrane leads to leakage of melanin from the damaged cells into the papillary dermis, which is engulfed by dermal melanophages. Therefore, this process may provoke the hyperpigmentation in RM (Nakayama, 1984 and Imokawa, 1987). Traditional laser treatments for RM had been used widely for many years.

However, treating RM with the traditional laser therapies such as 694nm ruby laser, 755nm alexandrite laser and 532nm Q-switched Nd:YAG laser provokes purpura, crust, PIH and scarring. It is extremely difficult to treat RM without inducing PIH(Smucker,2014).To order to solve the side effects such as crust, purpura, PIH and scarring caused by the traditional laser therapy, the authors devised a new treatment using Dr. HoonHur'sGPT with a high fluence 1064nm QSNL(Spectra Laser, Lutronic, South Korea) at a one-week interval with a spot size of 7mm,a fluence of 2.4J/cm<sup>2</sup> and a pulse rate of 10Hz with slowly one pass by a sliding-stacking technique to the RM.In the previous study, the authors already reported the

therapeutic effects of Dr. HoonHur's GPT with a high fluence 1064 nm QSNL in various skin diseases such as café au lait spot, partial unilateral lentiginosis, Becker's nevus, Ota's nevus and



**Fig.16. A complete clearance of Riehl's melanosis (after Dr. HoonHur's GPT)**



**Fig.17. There is no recurrence at 6 months' follow-up.**

congenital melanocytic nevus without side effects such as PIH and scarring are also achievable (Hur, 2017 & 2016). The wavelength of 1064 nm used in Dr. HoonHur's GPT would be preferable to the 532 nm wavelength of Q-Switched Nd:YAG laser, 694 nm wavelength of ruby laser and 755 nm wavelength of alexandrite laser because the longer wavelength result in less absorbed by the epidermal melanin and deeper tissue penetration (Hur, 2017 & 2016). This mechanism without

epidermal damage is able to stimulate the platelets which secrete platelet-derived growth factor (PDGF), epidermal growth factor (EGF), transforming growth factor-beta1 (TGF-beta1), TGF-beta2 and TGF-beta3 to activate the macrophages. EGF can accelerate reepithelization and the recovery of damaged basement membrane in the epidermis. The activated macrophages secrete TGF-beta3 and basic fibroblast growth factor (bFGF) which stimulate the fibroblasts (Shah, 1995 and Hur, 2017 & 2016). Subsequently the activated fibroblasts produce the extracellular matrix such as natural hyaluronic acid, collagen, elastin and fibronectin which can recover the damaged basement membrane. The recovered basement membrane does not lead to leakage of melanin from the damaged cells into the papillary dermis anymore (Shah, 1995 and Hur, 2017 & 2016). Also performed weekly, Dr. HoonHur's GPT with a high fluence 1064 nm QSNL may provoke the photobiostimulation which activates the dermal melanophages (Hur, 2017 & 2016). The dispersed melanosomes and melanins, which are the end products of damaged epidermal melanocytes, are either removed by the transepidermal elimination or are removed rapidly by the activated dermal melanophages via the lymphatic system (Hur, 2017 & 2016). In the end, it is possible to achieve complete clearance of RM without any side effects or recurrences. In our study, all of the 11 patients were received 50 treatment sessions of Dr. HoonHur's GPT with a high fluence 1064 nm QSNL (Spectra Laser, Lutronic, South Korea) at a one-week interval with a spot size of 7 mm, a fluence of 2.4 J/cm<sup>2</sup> and a pulse rate of 10 Hz with slowly one pass by a sliding-stacking technique to the RM.

It is possible to deliver sufficient energy to activate the dermal melanophages and in the same time salvaging normal background tissue, preventing PIH and scarring from being triggered, and minimizing epidermal damage without inducing purpura and crusts. However, Dr. HoonHur's GPT requires the continuous 50 treatment sessions for one year. In this study, 11 patients with RM (Fig. 1, 3, 5, 7, 9, 12, 15) were treated with Dr. HoonHur's GPT using a high fluence 1064 nm QSNL. All of the 11 patients with RM were achieved complete clearance of the pigmented lesions and PIH and scarring were not found (Fig. 2, 4, 6, 8, 10, 13, 16). There were no recurrences after a follow-up of 6 months (Fig. 11, 14, 17). All patients were satisfied with the results of Dr. HoonHur's GPT without any side effects, including PIH and scarring. And in order to prevent the new attack of RM, the avoidance of causative allergen in cosmetics and continued sun protection are necessary.

## Conclusion

In this study, Dr. HoonHur's GPT using a high fluence 1064 nm QSNL achieved complete clearance of RM without side effects and recurrences. We propose Dr. HoonHur's GPT using a high fluence 1064 nm Q-switched Nd:YAG laser as a new, safe and good option for treating RM.

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