Phototherapy As A Stimulus In Proliferation of Melanocytes to Cure Vitiligo Patches

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Abstract

UVB radiation phototherapy and the 337.1 nm pulsed nitrogen laser are targeted to affected lesions only. The use oflaser in the treatment limits the total skin exposure to UV radiation and the risk of skin cancer may also be reduced. It was also found that the lesions treated with nitrogen laser show slightly more pigmentation.

INTRODUCTION

An epidermic disorder of melanocytes causing white patches on various parts of human body called vitiligo has its dermatological defination as stated under

"Vitiligo is an acquired progressive disorder that selectively destroys of some or all melanocytes residing in the interfollicular epidermis and sometimes in the hair follicles as well. Vitiligo is melanocytopenia manifested clinically by circumscribed achromic macules (patches) often associated with leucotrichia (white hairs on vitiliginous patch) with unpredictable course."

Narrowband UVB therapy

Narrowband UVB therapy involves delivery of specific wavelengths of light (311 nm), in gradually increasing doses two or three times a week, to the entire body or to a part of it using specially designed lamps (e.g. TL-01, Phillips of Holland. The letters TL stand for tube light in phototherapy chambers). The nominal wattage of each lamp is 100 watts at 1000 milli Amperes.

Laser therapy in vitiligo

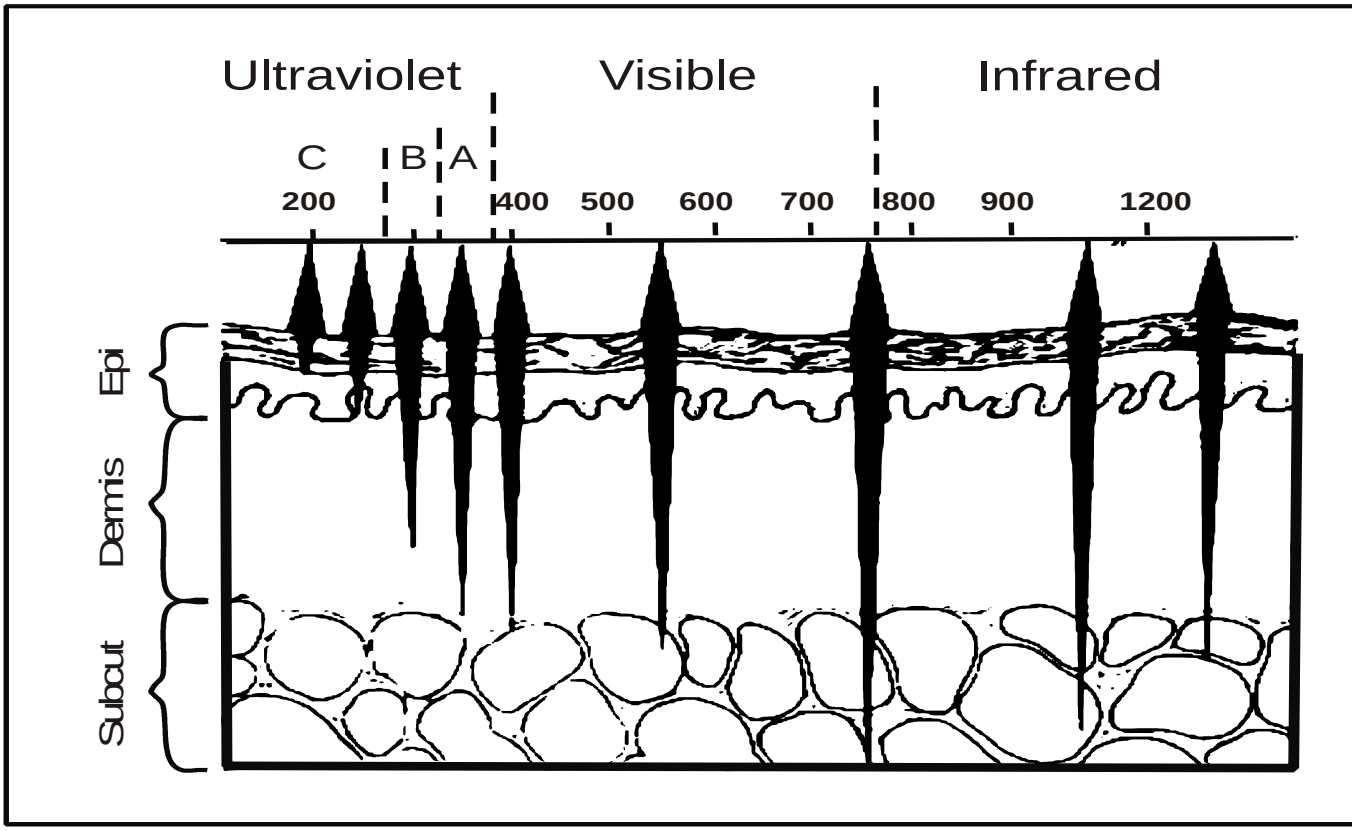
We used UVA-2 nitrogen laser for rapid re-pigmentation and inhibition of vitiligo patches, with minimum side effects and reduced treatment duration. It brings improvement through immuno-modulation by affecting the mediating T-cell. High efficiency of this laser system in treatment of vitiligo is due to its special photobiological characteristics. Melanocyte is stimulated and induces re-pigmentation of the achromic areas

Melanin

Any of several organic compounds, dark biological pigment that give coloration (shades of yellow or brown) to skin, hairs, feathers, scales, eyes, and some internal tissues, notably the substantia nigra in the brain. In humans melanin help to protect the skin against the damaging effects of UV radiation, but melanoma may arise from cell that produces it. The amount in the skin depends on both genetic and environmental factors. Melanin is produced from the Amino Acid Tyrosine.

Patches on palms, soles, lips etc. hairless regions re-pigmentation can be brought out by lasers only after longer treatment as these regions do not respond to conventional drug therapy. Rate of re-pigmentation is rapid initially, decreases slowly, increases after erythema reduces. Minimization of side effect causes due to laser exposures.

Diagrammatic representation of the variation in penetration of UV,visible and near IR radiation into tissue (figure not scaled)



Laser accelerates tyrosinase activity.
Low energy laser irradiation influences catecholamine synthesis in vitiligo.
Laser stimulate the synthesis of melanin pigmentation in the skin by increasing tyrosinase activity and stimulation in the proliferation of melanocytes.

Conclusion
UVB radiation phototherapy and the 337.1 nm pulsed nitrogen laser are targeted to affected lesions only. The use oflaser in the treatment limits the total skin exposure to UV radiation and the risk of skin cancer may also be reduced. It was also found that the lesions treated with nitrogen laser show slightly more pigmentation.

REFERENCES

1) James M. Spencer, Jyotendra Ajmeri : Treatment of vitiligo with 308 nm Excimer Laser-A pilot study, J Am Acad Dermatol 2002, 46 : 727-731.
2) G Manchini, E Tsoureli : J Hercogova Narrow Band UVB Micro-photo therapy – A new treatment for vitiligo, J Eur Acad Dermatol, Venereol. 2003, 17:171-177.
3) Hsin-Su Yu, Chieh shan Wu, Chia-Li Yu et.al. Helium Neon laser irradiation stimulates migration and proliferation in melanocytes and induces repigmentation in segmental type vitiligo. J. Invest Dermatol 2003; 120: 56-64.
4) Lubomira Scherschun, Jane J. Kim, Henry Wehim : Narrow Band UVB is a useful and well tolerated treatment for vitiligo, J Am Acad Dermatol. 2001, 44:999-1003.
5) Thierry Passeron; Nima Ostovari et.al. Topical Tacrolimus and 308 nm excimer laser : A synergistic combination for the treatment of vitiligo. Arch Dermatol 2004; 140:1065-1069.
6) Fridman SR, Geronemus RG : Use of 308 nm excimer laser for post resurfacing leucoderma. Arch Dermatol 2001; 137:824-825.
7) Baltas E, Negy P, Bonis B et al : Repigmentation of localised vitiligo with xenon chloride laser. Br J Dermatol. 2001; 144:1266-1267.
8) B.H. Pawar, S.S. Arsad *et al* Study of photo therapy with pulsed UV Nitrogen Laser for repigmentation in segmental type vitiligo, NLS-6, 2006, A-B, pp86.
9) B.H. Pawar, S.S. Arsad *et al* Comparitive study of photochemotherapy for repigmentation in vitiligo. NCOL 2007,Abstract, pp-71