

Phototherapy: A healing power of light

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Abstract:

Light can heal many skin disorders. Researchers were motivated to study specific wavelengths in order to safely treat the disorders. Many institutes worked to harness the therapeutic light rays. It was necessary to eliminate the rays with damaging wavelengths .Phototherapy is the application of light rays with standard parameters like wavelength ,energy to treat specific skin disorders. It is found that ultraviolet light is safe and effective in dermatology for diseases like psoriasis ,vitiligo. It is also useful in neonatal care. The photo-responsive skin diseases are well treated with phototherapy in modern medical institutes. Home phototherapy is gaining popularity as well. The scope of phototherapy in skin disorders like vitiligo ,psoriasis ,child care, baldness ,hair removal etc. discussed here with practical reports from various places.

Introduction:

Phototherapy has undergone many changes over last few decades. Initially laser with high output power was considered as treatment tool but it was found that laser with minimal dose is sufficient to interact with the thin layers of skin. The advancement in the technology came up with many alternative light sources giving the similar results. The reports from various sources readily accepted phototherapy as suitable option for the treatment.

Materials and Method:

Vitiligo, a skin disorder characterized by white patches resulting from absence of melanin produced in melanocytes. It is found worldwide in all types of race, ethnic background, or gender. It causes psychological stress. In indian culture vitiligo is considered as a curse for female. Phototherapy, surgical grafting techniques, and melanocyte transplants are the recent trends in the treatment of vitiligo. There is the possibility that the use of cytokines and growth factors that may mimic the actions of phototherapeutic agents at the cellular level and use of immunomodulators may prove helpful.[1] This is a very exciting phase of vitiligo research in which vitiligo is being tackled by multipronged attacks in the form of advancement in basic research, genetics and treatment including surgical management. In order to achieve the ultimate goal of total stability and complete repigmentation, there is a need to define a roadmap and roadblocks.[13] In a recent preliminary study, afamelanotide (16 mg subcutaneous implant) along with Narrowband UVB has given promising results.[14] Further, controlled studies are required to confirm its efficacy and define its role in the management of vitiligo.

A comprehensive database search of MEDLINE, EMBASE, and the Cochrane library from inception to January 26, 2016, was performed for all prospective studies. The main keywords used were *vitiligo, phototherapy, psoralen, PUV, ultraviolet, NBUVB, and narrowband*. [15] Long-duration phototherapy should be encouraged to enhance the treatment response in vitiligo. The greatest response is anticipated on the face and neck. [15]

Infant care is one more application of phototherapy. It is used for treatment of neonatal hyperbilirubinemia.[2] The results of phototherapy is dependent on the absorption of light photons by the bilirubin molecules. Bilirubin can absorb light of certain colors or wavelengths. Since bilirubin is a yellow pigment, during phototherapy, the blue and green light is best absorbed by the bilirubin molecule.[3] When broad-spectrum white light is used for treatment, only a fraction of the light is acting on the bilirubin.[4] Blue light having wavelength 450 nm is absorbed as compared to green light [3] The light used must penetrate the newborn's skin. The green light has longer wavelength and it is expected to penetrate the baby's skin deeper. It is not confirmed whether the use of green light has any advantage over blue light.[5][6][7] A new high-intensity phototherapy light source using recently introduced high-intensity gallium nitride light-emitting diodes (LEDs).[12] This device has a narrow luminous spectrum, and therefore allows for the first time to compare blue (peak 459 nm) versus blue-green (peak 505 nm) phototherapy.

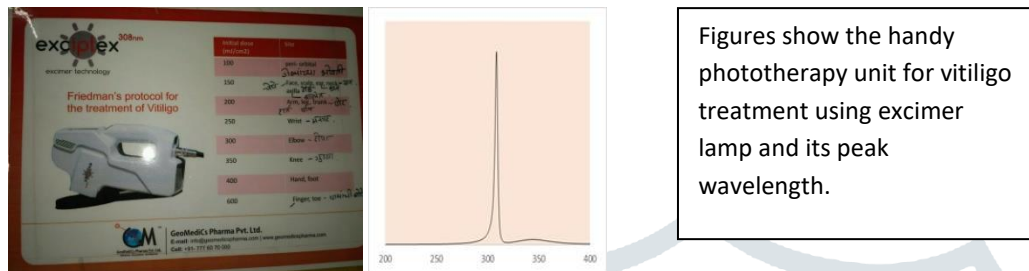
In Netherland NBUVB used for treatment of psoriasis .Ultraviolet B phototherapy administered at home is equally safe and equally effective, both clinically and for quality of life, as ultraviolet B phototherapy administered in an outpatient setting. Furthermore, ultraviolet B phototherapy at home resulted in a lower burden of treatment and led to greater patients' satisfaction.[16] Baldness is referred as alopecia in medical science. It is a common disorder affecting more than half of the population worldwide. Androgenetic alopecia, the most common type, affects 50% of males over the age of 40 and 75% of females over 65. Hair transplant is the treatment alternative but the evidence for low-level laser therapy (LLLT) applied to the scalp as a treatment for hair loss and discusses possible mechanisms of actions. LLLT for hair growth in both men and women appears to be both safe and effective. The optimum wavelength, coherence and dosimetric parameters are expected to be determined.[17]

In cosmetology Intense pulsed light technologies are in practice for two decades now. Intense Pulse light devices can be used safely and effectively for the cosmetic treatment of many vascular lesions, unwanted hair, and pigmented lesions. These are newer technologies giving results equal to those of laser treatments.[18] Intense pulsed technology is a highly versatile, safe, and effective modality for the treatment of vascular and pigmented lesions, hypertrichosis, and epidermal and dermal atrophy associated with photoaging, as well as acne, rosacea etc. The biological efficacy of various wavelength distributions can lead to range of IPL technology. The wavelength filters, pulse durations, pulse frequencies, and cooling modalities to protect from side effects. The end result will be a widening domain of IPL's clinical applications and indications. It will be incumbent on clinicians who use these devices with regularity for such new

and emerging indications to report their clinical experiences in order to sustain our continued understanding of the technology's long-term safety and efficacy profile.[18]

Conclusion :

The phototherapy is newer trend in the treatment of skin disorders .Intense Pulse light with various wavelengths are of prime importance in cosmetology. Low level laser Therapy is gearing up as a treatment tool for skin disorders. NBUVB has been accepted as effective treatment tool for vitiligo and psoriasis. The understanding of new sources with specific wavelength and sufficient power can make phototherapy more preferable alternative in skin care and disorders.



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