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Systemic effects of photo and photochemotherapy

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Phototherapy (UVA1)/photochemotherapy (PUVA) is a well established treatment of several dermatoses, such as cutaneous lymphoma, psoriasis and vitiligo among others. Under this treatment, patients develop generalized hyperpigmentation due to increased skin melanization and melanocyte proliferation, which is the rationale for its use in vitiligo and other hypopigmentary skin disorders. There is clinical evidence that hyperpigmentation not only affects exposed but also unexposed skin, albeit to a lesser extent, denoting that an endocrine effect results from release of melanocyte mitogens. To evaluate this possible systemic (endocrine) effect, plasma was collected from patients (n=16) treated with UVA1 and PUVA before and 1 and 2 h following irradiation at day 0 and day 14 of therapy. Plasma endothelins (1-3), α -MSH, basic-FGF, HGF, SCF and GM-CSF were assessed by ELISA. Results revealed significant elevation of both endothelins (potent melanocyte mitogens) and α -MSH (a melanocyte mitogen and immunomodulator) 2 h following irradiation when compared with values before irradiation session on day 0 ($p < 0.05$). This significant difference, however, was not observed on day 14 of treatment. Nevertheless, both endothelins and α -MSH values at day 14 remained higher than their corresponding time points (before and 2 h following irradiation session) at day 0 ($p < 0.01$ and < 0.05 , respectively). Interestingly, endothelin values were almost doubled under PUVA treatment than under UVA1 therapy, whereas α -MSH levels showed no clear difference between UVA1 and PUVA therapy. On the other hand, no significant changes in basic-FGF, HGF, SCF and GM-CSF plasma levels were detected after photo and photochemotherapy. Generalized tanning (hyperpigmentation) was clinically obvious in all treated patients. These findings indicate that UV light irradiation, whether alone or in combination with psoralene has a systemic (endocrine) and sustained effect through release of endothelins and α -MSH in the circulation. This may provide an explanation not only for the generalized tanning effect but also for the local and systemic anti-inflammatory effects of UV light irradiation. Furthermore, total body irradiation may be more beneficial than localized irradiation in inflammatory and hypopigmentary skin disorders.

Biography

M Badawy Abdel-Naser has completed his PhD from the Free University of Berlin, Germany where he also received training in the field of Dermatology and Venereology (1989-1992). He has received the title of Dr. Med. (PhD) in 1992 from the Free University of Berlin (FU). He has worked as a Research Fellow at New York University Medical Center, New York, USA (1993-1995) and his main research field were melanocyte biology and related disorders, such as vitiligo and melanoma. He is currently working as a Visiting Professor of Dermatology and Venereology, Dessau Medical Center, Dessau, Germany. He has published more than 37 papers in reputed journals and contributed to more than 12 chapters in textbooks in the field of melanocyte and sebocyte biology and related disorders.

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