Photochemotherapy
A Reappraisal of its Use in Dermatology

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Contents

Summary ................................................................. 822
1. Historical Background ........................................ 823
2. Different Psoralens .............................................. 823
3. Mechanism of Action ........................................... 824
4. Action Spectrum .................................................. 824
5. Pharmacokinetic Factors ....................................... 824
6. Clinical Indications for PUVA ................................. 825
   6.1 Psoriasis ........................................................ 825
   6.2 Cutaneous T-Cell Lymphoma ............................. 825
   6.3 Vitiligo ....................................................... 826
7. Contraindications for PUVA .................................... 826
8. Treatment Schedules ............................................ 826
9. Treatment Cabin ................................................ 827
10. Therapeutic Response .......................................... 828
   10.1 Psoriasis .................................................... 828
   10.2 Cutaneous T-Cell Lymphoma .......................... 828
   10.3 Vitiligo .................................................... 829
11. Adverse Effects ................................................ 829
   11.1 Epidermal and Dermal Changes ......................... 829
   11.2 Carcinogenesis ............................................ 830
   11.3 Ocular Effects ............................................. 832
12. Combination Therapy in Psoriasis .......................... 833
12.1 PUVA/Retinoid Combination ............................... 833
13. Protection of Patients and Staff ............................. 833
14. Conclusions .................................................... 835

Summary

Oral psoralen photochemotherapy was introduced for the treatment of psoriasis in the mid-1970s. Since then it has become an established technique, generally giving good clearance rates of affected areas, and its usefulness has extended to treatment of other condi-
Photochemotherapy: A Reappraisal

It is popular with patients but possible ocular complications must be avoided and the potential for carcinogenesis should be recognised. Although essentially palliative rather than curative, it has achieved major successes in the treatment of psoriasis and cutaneous T-cell lymphoma, and is also of benefit in the management of vitiligo. This article reviews over a decade of clinical and laboratory findings. Therapeutic responses are summarised and consideration is given to the protection of patients and staff.

1. Historical Background

The origins of photochemotherapy can be traced to the Middle East (Weber 1980). The story begins over 2000 years ago with the discovery in Egypt that seeds from a plant which grew by the banks of the Nile had certain effects when they were applied to the skin. However, it was not until 1947 that an Egyptian dermatologist by the name of Abdel Monem El Mofty began to probe its usefulness in modern medicine. His attention was drawn to 2 female patients who had vitiligo. This was a common enough condition but El Mofty’s curiosity was aroused by 1 or 2 unusual features of the cases. The white skin patches contained partly confluent pigment spots, and there was hyperpigmentation of the normal surrounding skin. When questioned, the women said that they had a cure for the disease in their own village. They simply ate the seed of a plant that grew on the banks of the Nile and then exposed their skin to the sun and this produced repigmentation of the white patches. In fact, the treatment is successful in only about 20% of vitiligo cases. The seeds came from umbelliferous plants, known as Ammi majus. The photosensitising chemical was found to be methoxsalen (8-methoxypsoralen; 8-MOP). Ultraviolet radiation is classified by wavelength as UV A, UVB or UBC. Clinical results in treating vitiligo were improved with the introduction of artificial UVA light sources (UVA: wavelength region 315nm to 400nm) [Fulton et al. 1969]. It was an Iranian, Seyed Abdol Majid Mortazawi, who first applied methoxsalen + UVA to the treatment of psoriasis in 1972 (Mortazawi 1972). Thereafter, others treated psoriatic patients and improved on the technique. In 1974 Parrish and colleagues in the United States published the results of their studies in which they had administered psoralen in tablet form rather than topically (Parrish et al. 1974). The technique became known colloquially as PUVA (psoralen + UVA). Soon large scale clinical trials were underway and the early promise of the technique was fulfilled.

2. Different Psoralens

Of the many psoralens isolated and synthesised 3 are in routine clinical use. Methoxsalen, 5-methoxypsoralen (5-MOP), and topical trimethylpsoralen (TMP) have no apparent beneficial effect when used alone, and it is only when combined with UVA irradiation that a therapeutic effect is evident. Of these drugs, the most commonly used and studied member is methoxsalen. Recently, increasing interest has been shown in 5-methoxypsoralen, which is said to be as effective as methoxsalen, with a reported reduction in acute adverse effects such as nausea, erythema and pruritus (Honigsmann et al. 1979). Because 5-methoxypsoralen is significantly less phototoxic, higher drug dosages can be recommended to achieve a similar therapeutic action. Heavy pigmentation may result from this agent, an adverse cosmetic effect which, however, has been used to advantage in the treatment of vitiligo and for photoprotection in the photodermatoses. As yet, no evaluation of the long term risks of these 2 psoralens has been made although murine studies suggest a similar potential for photocarcinogenesis (Young et al. 1983).

Trimethylpsoralen is used on a regular basis in Scandinavia as a topical treatment applied by bath immersion. It is a potent photosensitiser which apparently achieves good results and requires only low doses of UVA (Turjammaa et al. 1985). When administered orally it is poorly absorbed.