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Editorial

Photodynamic therapy: promise and problems

Photodynamic therapy (PDT) has been used to treat skin tumours as early as 1978[1] and more recently for pre-malignant conditions such as actinic keratosis. Like any new treatment, it has brought a lot of excitement. PDT is a two-stage procedure: initially the skin lesion needs to be curetted to remove the hyperkeratotic surface to ensure better penetration of the photosensitizer. After occlusion for a few hours, a calculated dosage of light energy is illuminated onto the lesion to activate the absorbed photosensitizer and to produce the anti-tumour effect. The mechanisms are believed due to direct cytotoxic effect of the free radical produced, anti-vascular effect, pro-inflammatory effect and induction of anti-tumour immunity.[2]

The high cost of the better absorbed photosensitizers (e.g. around HKD 3000 for 2 gm of methyl-aminolevulinate, Metvix™) together with the required prolonged pre-irradiation occlusion time (3 to 6 hours) and the pain associated with treatment are some of the potential barriers that prevent this method from gaining popularity.

However, the initial excitement aroused by PDT is not unjustified. Firstly, the cosmetic result in the treatment of superficial lesions (e.g. actinic keratosis) is excellent, in contrast to the scarring or pigmentation of cryotherapy, which is a commonly used alternative. Secondly, it can treat a number of lesions at the same time. This is an advantage as actinic keratosis is a multi-focal disease and multiple lesions need to be treated simultaneously. Thirdly, PDT can be repeatedly used to treat residual or relapsed disease and there is no limitation on the number of treatments given. This compares favourably with superficial X-rays, for example, which can usually be delivered only once. As an out-patient treatment with no complex technical requirement, this is another advantage.

Currently the spectrum of skin diseases that can be treated with PDT is slowly expanding. It has been tried on extramammary Paget's disease,[3] Darier's disease,[4] acne vulgaris,[5] and even leishmaniasis,[6] with variable success.

In 2006, PDT has been included as one of the indicated treatment modalities for Bowen's disease by the British dermatologists[7] and a study of the modality in the treatment of Fitzpatrick type IV patients with Bowen's disease in Singapore is published in this issue of the journal. The overall clearance rate of 73.2% at 3 months however is slightly lower than that obtained among Caucasians. The authors point out that large lesions e.g. >3 cm usually have a lower clearance rate as well as those in the genital area. They also proposed to increase the dosage of the red light by 10-15% to 41-43 J/cm^2 to overcome the problem of increased melanin absorption.

I surmise that the reason for poorer outcome of large lesions could be due to sampling bias as sites of micro-invasion in the thicker lesional areas could have been missed by a peripheral biopsy. It is also possible that parts of the larger lesions may have evolved into an early squamous cell carcinoma which is a more aggressive disease. Besides, the pain experienced in treating genital lesions could prevent a full dosage of energy be delivered, hence under-treating these patients. On the other hand, I have some reservation for the proposed increase in illumination dosage unless we know the melanin content of the Bowen's disease among patients with different Fitzpatrick's skin types.

As for the future of PDT, it very much depends on how well we can reduce the pain induced by the treatment and the availability of more effective and less expensive sensitizers and the adoption of novel strategies.[8] The refinement in these areas would definitely enhance the versatility of photodynamic therapy.

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