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Commentary – The CC genotype of the *ERCC1* C118T single-nucleotide polymorphism impacts positively on the efficacy of NB-UVB therapy for vitiligo

Vitiligo is a common depigmenting skin disease with a prevalence of 1-2%.[1] Although the exact aetiology and detailed pathogenesis of vitiligo is not fully understood, autoreactive T cell responses against melanocytes are clearly involved in the development of the disease.[2,3] Of several immunosuppressive treatments, narrow-band ultraviolet B (NB-UVB) now represents the phototherapy of choice for inducing repigmentation in patients with generalised vitiligo where depigmented areas affect multiple sites or large areas of the body. Indeed, more than 75% repigmentation has been achieved in over 50% of patients.[4,5] It is also useful for halting the progression of currently active vitiligo; stabilisation of the disease was evident in 80% of treated patients.[5] Comparative studies have indicated also the superior efficacy and better safety profile of NB-UVB over psoralen with UVA.[6,7]

As yet, the precise mechanism of action of NB-UVB in repigmenting vitiligo lesions is unknown. However, NB-UVB can activate the release from keratinocytes of endothelin-1 and basic fibroblast growth factor, which stimulate melanocyte, and can stimulate the expression of focal adhesion kinase and matrix metalloproteinases, which may enhance melanocyte migration from the outer root sheath of the hair follicle into the epidermis.[8] In addition, during NB-UVB irradiation, skin-infiltrating T cells are induced to apoptose due to the accumulation of DNA damage in the form of cyclobutane pyrimidine dimers.[9] Repair of such damaged DNA is managed via the nucleotide excision repair (NER) pathway and, interestingly, single-nucleotide polymorphisms of the DNA repair gene *APE1* have been associated with susceptibility to vitiligo.[10]

In this issue of the *BJD*, Dai *et al*[11] investigated whether allelic variants of the NER gene *ERCC1* (excision repair cross complementation 1) could influence the efficacy of NB-UVB treatment of vitiligo. Their study of 86 patients with active vitiligo indicated that those with the CC genotype of the *ERCC1* C118T single-nucleotide polymorphism demonstrated higher levels of repigmentation as well as an earlier appearance of repigmenting lesions following therapy with NB-UVB. Furthermore, the T lymphocyte apoptosis rate and cyclobutane pyrimidine dimer levels were significantly higher in patients with the CC genotype in comparison to those with the TT and CT gene variants. Overall, this interesting study provides evidence that genetic polymorphisms of certain NER genes can positively impact on the outcome of NB-UVB efficacy in the treatment of vitiligo by weakening DNA repair mechanisms leading to T cell death and so improved repigmentation rates.

Conflicts of interest

None declared.

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