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Editors: P. Itin, G.B.E. Jemec

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Actinic Keratosis

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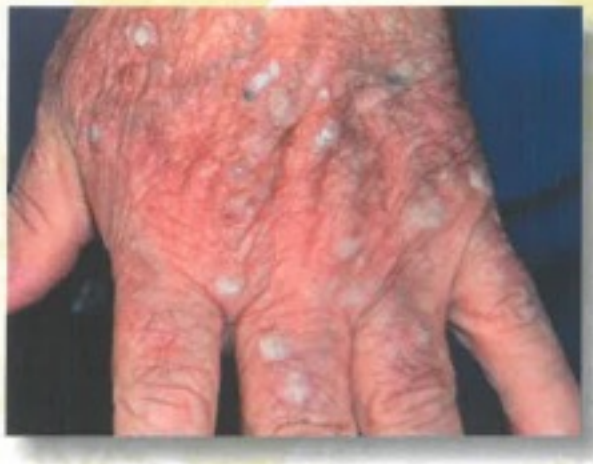

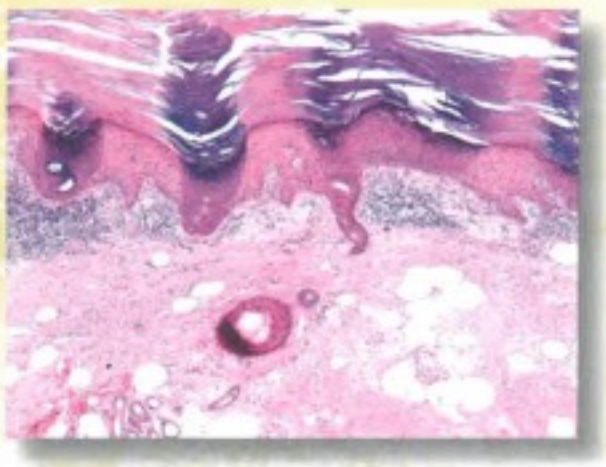

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Field Cancerization: From Molecular Basis to Selective Field-Directed Management of Actinic Keratosis

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Abstract

The incidence of non-melanoma skin cancer (NMSC), including actinic keratosis (AK), squamous cell carcinoma (SCC), Bowen's Disease (BD) and basal cell carcinoma (BCC), is increasing. UVA and UVB radiation lead to genetic alterations in keratinocytes, which eventually result in skin cancer. In the concept of field cancerization of the skin, genetically altered keratinocytes accumulate over an area exposed to UV radiation. Field treatment not only clears clinically visible NMSC lesions but also potentially targets subclinical 'sleeping' cell patches and fields. Topical treatments are available for the field-directed management of NMSC. They are either self-administered by the patient (ingenol mebutate, diclofenac, imiquimod or 5-FU) or administered by the dermatologist (photodynamic therapy (PDT)). This article discusses the treatment options with respect to their efficacy, tolerability and selectivity. Selective treatment options for atypic keratinocytes include imiquimod, ingenol mebutate, diclofenac and PDT. PDT yields 100% treatment compliance because it is always administered by the treating dermatologist. The efficacy rates achieved with PDT significantly exceed those of the patient-administered topicals. The first clinical trials assessing the effects of PDT on field cancerization clinically, histologically and immunochemically have been conducted and have yielded promising results. Preventive effects and a delay in the re-occurrence of NMSC have been observed in animal experiments of ingenol mebutate and PDT, whereas for the latter, clinical data are already available.

Molecular Genetic Consequences of UV Radiation on Human Skin

UV radiation is recognized to be the most important cause of the development of non-melanoma skin cancers (NMSCs), including actinic keratosis (AK), squamous cell carcinoma (SCC), Bowen's Disease (BD) and basal cell carcinoma (BCC). The UV spectrum (100–400 nm) consists of UVA (320–400 nm), UVB (280–320 nm) and UVC radiation (100–280 nm). While UVA (90–95% of UV radiation) and UVB (5–10%) reach the human skin, UVC is mainly absorbed by the ozone layer. UVA penetrates deeper into the skin than UVB, and it is responsible for epidermal as well as dermal changes, e.g. wrinkles and signs of skin