Actinic Keratosis as a Marker of Photodamage

One of the ways people recognize Nicole "Snooki" Polizzi, from the popular reality-TV show *Jersey Shore,* is her unnaturally dark, tanned skin. She may not realize it, but her skin is suffering from photodamage caused by the time spent on the beach covered in tanning oil. Given the proven causal relationship between UV radiation and skin cancers, she can look forward to many visits to the dermatologist in the future.

Actinic keratoses (AKs) are the most frequently encountered sun-related lesions in dermatologic practice. Conventionally, AKs have been described as being "precancerous" because they have the potential to become an invasive squamous cell carcinoma (SCC) over time. However, some experts consider these lesions in situ carcinoma. The Department of Veterans Affairs Topical Tretinoin Chemoprevention Trial, which examined over 7500 AKs on 169 participants for up to 6 years, found the risk of progression of AK to primary SCC (invasive or in situ) to be 0.6% at 1 year and 2.57% at 4 years.[1] Approximately 65% of all primary SCCs and 36% of all primary basal cell carcinomas diagnosed in the study cohort arose in lesions that previously were diagnosed clinically as AKs. Although many AKs undergo spontaneous regression over time, the malignant potential of AKs warrant appropriate treatment.

There are many physical, chemical, and photobiological modalities currently in use for the treatment of AKs. Cryotherapy using liquid nitrogen is the most frequently used method in the office setting for a single or a few AKs. When AKs are more numerous, large, or subclinical, cryotherapy is less practical, and dermatologists often opt for topical medications applied by the patient at home. Topical 5-fluorouracil and diclofenac have been used effectively for AK therapy. Imiquimod creams 5% and 3.75%, which work by inducing interferon-α and other cytokines, are a more recent addition to the topical modality. Ingenol mebutate, a plant extract of *Euphorbia peplus*, as well as resiquimod, a molecule similar to imiquimod but 10 to 100 times more potent, are currently being evaluated for the treatment of AKs.[2] The adverse effects of all topical therapy are usually limited to local skin irritation.

Another option is photodynamic therapy (PDT). The current US Food and Drug Administration–approved PDT methodology uses a photosensitizer (5-aminolevulinic acid) and a blue light (417 nm) to preferentially target hyperproliferating cells of AKs. This treatment is approved for spot-treatment, although it can be used off-label as field therapy.

Some patients can be reluctant to initiate therapy for AKs because of the consequent skin irritation, redness, and pain. In such cases, it should be discussed that actinic keratosis is a sign of chronic sun damage. Invariably, the number of AKs in a given patient is in close proportion to other signs of cumulative sun exposure, such as dyspigmentation, telangiectasia, and fine wrinkles. Viewing of before-and-after treatment photographs which demonstrate not only ablation of AKs, but improved cosmesis in general, may encourage the patient to seek treatment. This is especially true of imiquimod and PDT treatment modalities.

There are multiple therapeutic options for AKs. Therapy should be tailored individually to meet the desired goal of preventing progression to skin cancers and to maximize patient compliance by discussing the possible options. Improvement of skin texture, tone, and overall cosmesis can provide an incentive for a patient to follow a prescribed therapy.

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