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Photokeratitis induced by ultraviolet radiation in travelers: A major health problem

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Abstract

Ultraviolet (UV) irradiation is one of the several environmental hazards that may cause inflammatory reactions in ocular tissues, especially the cornea. One of the important factors that affect how much ultraviolet radiation (UVR) humans are exposed to is travel. Hence, traveling is considered to include a more acute UVR effect, and ophthalmologists frequently evaluate and manage the ocular manifestations of UV irradiation, including UV-induced keratitis. The purpose of this paper is to provide an evidence-based analysis of the clinical effect of UVR in ocular tissues. An extensive review of English literature was performed to gather all available articles from the National Library of Medicine PubMed database of the National Institute of Health, the Ovid MEDLINE database, Scopus, and ScienceDirect that had studied the effect of UVR on the eye and its complications, between January 1970 and June 2014. The results show that UVR at 300 nm causes apoptosis in all three layers of the cornea and induces keratitis. Apoptosis in all layers of the cornea occurs 5 h after exposure. The effect of UVR intensity on the eye can be linked to numerous factors, including solar elevation, time of day, season, hemisphere, clouds and haze, atmospheric scattering, atmospheric ozone, latitude, altitude, longitudinal changes, climate, ground reflection, and geographic directions. The most important factor affecting UVR reaching the earth's surface is solar elevation. Currently, people do not have great concern over eye protection. The methods of protection against UVR include avoiding direct sunlight exposure, using UVR-blocking eyewear (sunglasses or contact lenses), and wearing hats. Hence, by identifying UVR intensity factors, eye protection factors, and public education, especially in travelers, methods for safe traveling can be identified.

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Introduction