

Do we really need sunscreens?

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Over the past few years, sunscreens have flooded the Indian market and are being promoted aggressively by manufacturers. Many normal individuals with no obvious skin condition regularly use and request sunscreens. There is little doubt that sunscreens have an important role to play in preventing acute and chronic effects of ultraviolet radiation in Caucasian skin, but does the same hold true for the predominantly Fitzpatrick type 4 and 5 skin types commonly found in the Indian subcontinent?

For this purpose, it is important to understand why sunscreens are useful for lighter-skinned individuals. Lighter skin has less melanin allowing ultraviolet light to penetrate the epidermis to cause acute actions such as erythema, deoxyribonucleic acid damage, immunosuppression, photolysis of folic acid and vitamin D synthesis.¹ Erythema and occasional sun-induced blisters are common in Caucasians and over a 1-year survey in the USA, 40% of the surveyed population reported acute sunburns. Chronic effects of ultraviolet radiation include freckles, telangiectasias, wrinkling and pre-cancerous lesions such as actinic keratoses and photocarcinogenesis. Sunlight-induced melanomas and non-melanoma skin cancers are major epidemiological problems. It thus makes perfect sense to protect less-pigmented skin in a variety of ways and sunscreens have a prominent role to play in this regard. Sun education starts at school where children are taught about sun precautions, careful sunbathing and the harmful effects of tanning beds. The general

population is encouraged to undergo an annual routine skin examination to detect skin cancers when dermatologists remove actinic keratoses and other suspicious lesions.

In darker skin types, there are several inbuilt mechanisms to protect against ultraviolet damage, obviating the need for annual routine skin examination. A thicker epidermis and greater amounts of melanin scatter and absorb ultraviolet radiation allowing only 7.4% of incident ultraviolet B and 17.5% of ultraviolet A to filter through in black skin compared to 24% of ultraviolet B and 55% of ultraviolet A in white skin.² Melanosomes in dark-skinned individuals act as natural umbrellas by accumulating as supra-nuclear caps and are resistant to degradation by lysosomal enzymes. The number of apoptotic cells after ultra-violet radiation is higher indicating efficient removal of any damaged cell. Eumelanin acts as a free radical scavenger and effectively laps up reactive oxygen species. Dermatologists rarely see freckles, actinic keratoses, telangiectasias and sun-induced wrinkles. Sunburns are uncommon, sun-induced blisters are extremely rare, while sunbathing and tanning beds are alien concepts. Caucasian skin is seventy times more likely to develop skin cancer compared with black skin with factors in addition to sunlight which may be important.³ The downside of this natural, efficient ultraviolet protection is the lower production of vitamin D3. Besides bone health, sunlight and vitamin D seem to have some protective roles to play in preventing colorectal cancers, breast cancers, prostate cancers and non-Hodgkin's lymphomas.⁴

Why then do Indians with their predominantly Fitzpatrick type 4 or 5 skins need sunscreens? Medical reasons include some fairer Indians with

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type Fitzpatrick type 2 or type 3 skins, individuals on beaches and mountains, specific patient groups who have any of the range of photosensitive or photo-aggravated disorders, disorders of pigmentation and also post-procedural patients. Even in these individuals, sunscreens have only a partial role to play besides other methods of sun protection such as seeking shade, avoiding the mid-day sun, using hats, umbrellas and sun-protective clothing. Experience from daily clinical practice in India reveals that many patients and even normal individuals request and use sunscreens not for the primary, internationally recommended reasons of preventing sunburns and skin cancers, but to prevent tanning in an attempt to maintain a fairer complexion. This is in tune with the Indian craze for fair skin and attempts by manufacturers to cash in on this craze. Even if sunscreens are used for this purpose, numbers of sun protection factor give only partial information, since they indicate protection against ultraviolet B radiation which causes the acute inflammatory effects, which are uncommonly seen in Fitzpatrick type 4 and 5 skins and some protection against the delayed tanning reaction. Broad-spectrum sunscreens protecting additionally against the ultraviolet A spectrum, also involved in immediate and persistent pigment-darkening reactions, make more sense. From a practical standpoint, one also has to consider the water resistance of sunscreens, given the ambient temperatures in many parts of India, which often soar beyond 40 °C (104 °F), much beyond the perspiration threshold at 31°C (87.8 °F). At an ambient temperature of 36 °C (96.8 °F), most of the body heat is lost by evaporation through sweat glands and since the Indian skin is acclimatized to these temperatures, sweating begins at a lower threshold, occurs faster and can reach 2 L/h. It is not only messy and uncomfortable to apply any cream or lotion in such conditions, especially the

expensive, recommended 30 ml (2 mg/cm²) for every 2 h, but also the likelihood of it being washed or wiped off is quite high. Considering all these facts, it would be difficult to justify the routine use of sunscreens for the millions of individuals in the Indian subcontinent who have Fitzpatrick type 4 or 5 skin types. A recent American article has recommended regular sunscreen use even for darker skin types but other American dermatologists have immediately responded with skeptical comments.⁵ This is in no way to detract from the very important fact that increased awareness among patients and physicians is required to catch the occasional skin cancer at its primary stage and to avoid delayed and aggressive presentations, more often seen in darker skin types. Societal trends, consumer choice, physician beliefs and preferences and industry pressure on both consumers and prescribers also play an important role. Unbiased studies are required to support our viewpoint.

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