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Editorial

Sunscreen- The facts must known

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ABSTRACT

Sunlight is the most important natural source of energy for all living creatures. Sunlight stimulates hormone production, allows synthesis of vitamin D, promotes skin cell regeneration and contributes to an overall sense of well being of an individual. Sunscreens are agents that alter the effects of UV radiation on the skin by absorption or reflection of part of the incident radiation. It protects the skin from carcinogenic effects of burning rays.

Sunlight stimulates synthesis of melanin, which has a defensive role against harmful sunlight. With all the merits come the demerit; we Indians fall into Fitzpatrick skin type 3 to 5 which is very prone to tanning, photoaging,etc. Solar radiation is the root cause for diseases like solar urticaria, polymorphous light eruption, hydroa vacciniforme, chronic actinic dermatitis. On the other hand diseases like phototoxic reaction/photoallergic drug reactions and photocontact allergy are diseases aggravated by sunlight. Xeroderma pigmentosum, Cockayne syndrome, lupus erythematosus, porphyrias, pellagra, Darier's diseaseare few other conditions that have an association with sunlight. Thus above listed diseases become an absolute indications for using sunscreens.

Sunprotection becomes a very important concern not only in summer but round the year. Sun screening of the skin as well as hair should also be used even in winters, monsoon and cloudy days. Sunlight also has an adverse effect on hair as the UV rays degrade eumelanin and pheomelanin to oxymelanin, disrupt disulphide bonds causing weakness and fracture of hair, damage lipids in hair cortex, making hair dull, dry and lustreless.[1,2] Topical preparations have less patient compliance as they are cumbersome to apply on hair and give a greasy appearance without adherence to hair. Thus a better approach to hair photoprotection is the use of clothing, such as a cap, hat, scarf or umbrella. Judicious amount of sun screening along with physical protection with clothes is required especially on a beach as the skin can be damaged directly by the rays and indirectly due to scattered reflection from water. Total sun avoidance is most desirable, but outdoor occupations and lifestyles make total avoidance impossible for most individuals.

Sunscreens are agents that alter the effects of UV radiation on the skin by absorption or reflection of part of the incident radiation. Sunscreens maintain the elasticity of skin and prevent premature aging, tanning, pigmentation, sun burn and photodermatitis caused by UVA (320-400nm). It protects the skin from carcinogenic effects of burning rays (UVB (280-320 nm)). The effectiveness of a sunscreen can be measured mainly on the basis of three variables i.e SPF, Broad-spectrum protection and water resistance. SPF is

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defined as the ratio of the least amount of ultraviolet energy (UVB) required to produce minimal erythema on sunscreen-protected skin to the amount of energy required to produce the same erythema on unprotected skin.[3] Clothing indices like UV protection factor (UPF) is the ratio of average effective UV radiation irradiance transmitted and calculated through air to the average effective UV radiation irradiance transmitted and calculated through fabric (indicates how much longer a person can stay in the sun when fabric covers the skin, erythema being the end-point). The efficacy of a product is related not only to its SPF but also to its substantivity.[3]

Proper application of sunscreen is the most important factor for sun screening. It should be applied properly to all sun exposed areas in a concentration of 2 mg/cm^2, and allowed to dry completely before sun exposure. The Teaspoon rule[4] suggests that the person must apply 3 mL (slightly more than half a teaspoon) for each arm and for the face and neck while 6mL (slightly more than a teaspoon) for each leg, for the chest and for the back and it should be reapplied every 2 hours, and after swimming, vigorous activity, excessive perspiration or towelling.

Sunscreens have been divided into chemical absorbers and physical blockers on the basis of their mechanism of action.Now it is recommended that sunscreens should be classified as organic and inorganic, replacing the previously used terms “chemical” and “physical”, respectively. Organic UVA protectors are cinnamates while UVB protectors are Oxybenzene. Oxybenzene is primarily a UVB absorber but it also gives protection against UVA II., thus used as a broad spectrum sunscreen. Inorganic photo protectors include zinc oxide, ultrafine titanium oxide, iron oxide and calamine. Organic or chemical sunscreens are generally aromatic compounds conjugated with a carbonyl group, which allows the molecule to absorb high-energy ultraviolet rays and release the energy as lower-energy rays, thereby preventing the skin damaging ultraviolet rays from reaching the skin. Siltriazole [MexorylXL] is a newer broad spectrum sunscreen. Inorganic or physical blockers sunscreens reflect or scatter UVR. Nanotechnology makes inorganic sunscreens more cosmetically acceptable (less whitening of skin after application).

Systemic sun screening is a new concept in addition to topical sun screen. Compounds that have a systemic photo protective effect are β-carotene, anti-malarials, ascorbic acid, α-tocopherols (i.e., vitamins A, C, and E), retinol, selenium green tea polyphenols, corticosteroids provide some photo protection when taken orally. Polypodium Leucotomos (PL), or anapsos, is a natural mixture of phytochemicals with powerful anti-oxidant and photoprotective properties. It acts simultaneously as an antioxidant, photoprotective and anti-carcinogen.

Generally, sunscreens are available in the form of creams, lotion, gels, ointments, oils, butters, sticks, and sprays, which are considered over-the-counter (OTC) products. Less frequently used products include wipes, towelettes, powders, body washes, and shampoos, which are considered non-OTC products by the FDA. Of lately, many manufacturers have started formulating cosmeceuticals i.e cosmetic products that have medicinal properties like moisturizers, facial foundations, and foam foundations (mousse). Spray or gel-based sunscreens are preferred in oily skin and acne. New sunscreens with microfine particles are found to be safe and effective in patients with acne and rosacea. Sunscreen filters are also added to hair care products, such as shampoo, to minimize sun damage to hair.

The ideal sunscreen should have a high SPF rating, be well tolerated, cosmetically pleasant, non-toxic, equally effective against UVA and UVB, photostable, water-resistant and inexpensive. Higher the SPF better the Sun protection, is a very common misconception amongst the sunscreen user. A sunscreen with SPF 15 provides 93.3 % absorption of UVB, SPF 30 provides 96.7% and SPF 50 provides 98%.

Side effects mainly include contact irritant dermatitis (oxybenzone), photo contact dermatitis, aggravation of acne, contact urticaria. The majority of reactions are irritant in nature.[5] The most common complaint associated with sunscreen use is immediate stinging or burning on application, mostly experienced in the eye area. Urticaria caused by topically applied substances may be either immunologic (immunoglobulin E [IgE]-mediated type I allergy) or non-immunologic (toxic or due to direct mast cell degeneration). Exacerbation of acne and rosacea can also occur with the use of sunscreen agents that contain physical blockers, such as ZnO and TiO2, that are greasy and have large particle sizes, thereby blocking skin pores. Less exposure to sunlight may cause Vit-D deficiency in individuals using sunscreens with higher SPF as UVB is responsible for 90% Vit D synthesis in skin.

So, it seems a fair verdict from a dermatologist point of view to use graceful amount of sunscreen on Indian as well as non-Indian skin for an age-defying and healthy skin.

“Invest in your skin, it is going to represent you for a very long time!! Live, Laugh, Wear Sunscreen”

Conflict of Interest

None.

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