"SunSmart Plus": the more informed use of sunscreens

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ABSTRACT

- The sun protection factor (SPF) of sunscreens is determined by a testing protocol that specifies a sunscreen application rate of 2 mg/cm^2 on the skin.
- Most people, for cosmetic and economic reasons, only apply enough sunscreen to achieve an SPF of about a third or even a quarter of the level stated on the product.
- To increase public awareness of the problem, manufacturers could be required to state both a "tested SPF" and an "expected SPF" (a third of the tested SPF) on product labelling.
- The "SunSmart" message could be modified to make the public more aware of the actual protection level they are achieving with sunscreen. Other aspects of the SunSmart message (eg, sun avoidance, wearing protective clothing) should also be reinforced.

MJA 2004; 180: 36–37

WORLDWIDE, skin cancer kills about 50 000 people each year, 80% of the deaths being due to melanoma and most of the rest being due to squamous cell carcinoma. The mortality, morbidity and economic cost of skin damage induced by ultraviolet (UV) radiation is of major relevance to us all. Throughout the world the use of sunscreens is widely promoted, both educationally and commercially, as an important part of the strategy to reduce such skin damage. But are consumers getting what they expect?

It is now reasonably well understood within the medical and scientific community that the level of sun protection factor (SPF) stated on sunscreen products is usually not achieved by users, mainly because the products are applied inadequately.[1] Most people apply only enough to achieve an SPF of about a third or even a quarter of the level claimed.[2]

While the global sunscreen industry and its regulatory bodies (eg, the Therapeutic Goods Administration in Australia and the Food and Drug Administration in the United States) continue to deliberate on the laboratory performance of sunscreens (such as their ability to screen against UVA), there has been less emphasis on how best to encourage adequate (dose-effective) application of sunscreen products. This is despite the recent publication of dosage guides, based on the existing testing procedure, which are designed to ensure that users achieve the level of SPF claimed for products.[3,4]

Logic would suggest that more effective use of sunscreens would be beneficial, but it is far from clear whether this is the case. There is some evidence that sunscreens used regularly during unintentional sun exposure can prevent squamous cell carcinoma,[5] and they appear to reduce the development of solar elastosis. For basal cell carcinoma and melanoma the position is less clear, but recent concerns linking sunscreen use with the development of melanoma appear, so far, to be unfounded.[6,7]

Yet it is difficult to draw any evidence-based conclusions about sunscreens and their impact on skin cancer, given the known inadequacy and inconsistency of their application. It is not unlike studying the effects of a medication with no consistent dosage specified across subjects.

Application of sunscreen

The internationally accepted sunscreen testing protocol requires that a sunscreen product be applied to a test subject's skin at an application rate of 2 mg/cm^2. It is from this testing process that the SPF of the product is determined. The manufacturer or marketer then uses this figure on the product label to promote its efficacy. (An amount of 2 mg/cm^2 equates to approximately two finger lengths of product — about 3 g for an adult — applied to each of 11 areas of the body, each representing about 9% of body surface area [the "rule of nines"].[3])

However, for both cosmetic as well as economic reasons, sunscreen users are unlikely to be willing to apply sunscreen at the rate of 2 mg/cm^2. It is more likely that, despite such recommendations, they will continue to apply an amount with which they feel comfortable.

So it is surely important for people to be aware of how much protection they are *actually* achieving — or how much *less* protection they are achieving than expected.

Options for promoting more effective use of sunscreens

Although it has been known for many years that sunscreens are being inadequately applied,[8] there has, until recently, been little official effort to address the problem.

There have been calls to modify the testing procedure to reflect an application rate more in keeping with the amount of product used by consumers (using perhaps a half or even a third of the amount currently applied in testing).[9] However, this leads to technical difficulties in the testing procedure because of the difficulty of ensuring uniformity of application.

Another, more practical, proposition has been that the testing system be retained as it stands, but that the stated SPF results be scaled back (perhaps by a factor of 3 or even

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4) to reflect a more realistic level of achieved SPF (Peter Gies, Senior Research Scientist, Australian Radiation Protection and Nuclear Safety Agency, personal communication).

Another option is to refine the "SunSmart" message.[10] Perhaps the campaign slogan could be changed to something like "SunSmart Plus" or "SunSmart *and* Sunscreen Smart", accompanied by a message that gives members of the public a more realistic estimate of the level of protection they will actually achieve from using sunscreen. Given that this will be far less than they previously believed, the public will also need to be encouraged to take greater care in terms of sun avoidance, to regularly reapply sunscreen,[11] and to follow the other recommendations of the SunSmart message (eg, wearing sunglasses and protective clothing). If, as a result, they begin to apply more than the "average" amount of sunscreen, so much the better in terms of the protection they will achieve.

Applying a "one-third rule"

Given that people are reluctant to apply an amount of sunscreen commensurate with the 2 mg/cm^2 testing process, why not be pragmatic, as well as honest, about sunscreens, if we're serious about encouraging their effective use?

With the concept of the SPF of sunscreens well entrenched in the public mind, it would be unrealistic to introduce a novel rating system for sunscreen products. However, it would be relatively simple for regulators to enact a "one-third rule" that would divide the SPF rating achieved in testing by a factor of three, which would then be stated on the product as its "expected SPF", along with its "tested SPF".

Alternatively, health educators could promote the message that sunscreens actually offer no more than a third of the sun protection they claim.

Conclusion

The more informed, consistent and effective use of sunscreens and the more informed adoption of all the SunSmart recommendations could make a significant contribution to human health and wellbeing.

An enhanced campaign, with a message such as "SunSmart Plus", could set a goal of reducing the development of UV-related skin damage by a factor of 1% by the year 2010 and by 5% by the year 2020.

But while the public continues to be misinformed about the protection afforded by sunscreens,[12] they will continue to place their faith in products whose real-world efficacy has, for many years, been overstated.

Competing interests

The author is proprietor of Dox Products Ltd, manufacturer of a sunscreen spray in New Zealand — an unconventional, non-Standards Approved product.

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(Received 29 Jul 2003, accepted 9 Oct 2003) ❑