In This Issue—If It's Not the Hamburgers, It's the Sunscreens…

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The sunscreen active ingredients benzophenone-3 (BP-3), octyl-methoxycinnamate (OMC) and 3-(4-methylbenzylidene) camphor (4-MBC) have previously been reported to have estrogenic effects on cultured human breast cancer cells and, in the case of 4-MBC, also in the immature rat uterus *in vivo* (Schlumpf *et al*, 2001), raising the question of whether these compounds are safe to apply topically to humans. In this issue of the Journal, Janjua and colleagues report that generous daily whole-body applications (2 mg per cm^2, approximately 40 g) of a formulation containing maximal to twice maximal legally permitted concentrations of these three sunscreen agents in combination result in detectable plasma and urine levels in both young men and post-menopausal women, but have minimal to no effect on serum concentrations of reproductive hormones in either sex (Janjua *et al*, 2004). Four of 11 serum measurements (six in men, five in women) showed small but statistically significant differences between the first control week when subjects applied only the vehicle formulation, compared to the test week that followed, when they applied the combination sunscreen product. In two of these four instances, however, the differences were as large at time 0, before application of the test product, as at any later time during the week of daily sunscreen applications. This raises the possibility that the regimen with which the subjects agreed to comply—no exercise or sunbathing, and no ingestion of caffeine, alcohol, or nicotine—during the trial might have had at least as profound an effect on sex hormone status as the sunscreen applications.

The authors conclude that regular use of this super-sunscreen, and presumably all commercially available products that contain far less of the tested substances, should be quite safe for human use, although they express theoretic concern for use in small children with their possibly less adequate stratum corneum barrier, higher surface to volume ratio, and greater sensitivity to hormone exposure. Certainly, to this reader, it would appear that consumers should be less concerned about estrogen exposure from sunscreen than from McDonald's hamburgers. And, at least to date, no one has suggested that sunscreens cause obesity…but this has not yet been formally tested.

Perhaps a more interesting question than whether sunscreens pose a risk to sex hormone homeostasis is why there is such a continued effort to find harm in sunscreen use. For many years, there was a preoccupation with whether sunscreens were mutagenic and could cause cancer (Dunkel *et al*, 1992; Chetelat *et al*, 1993). A second loosely reasoned but long-standing concern has been that use of predominantly UVB sunscreens might promote photoaging and even melanoma by permitting greater UVA exposure (Garland *et al*, 1993; Autier *et al*, 1995; Westerdahl *et al*, 2000). More recently an alarm has been raised that sunscreen use causes hypertension, autoimmune diseases ranging from multiple sclerosis to diabetes, and cancer of multiple internal organs by blocking cutaneous vitamin D photosynthesis, on the rationale that vitamin D deficiency impairs cellular differentiation and immune function (Holick and Jenkins, 2003). And now the specters of precocious puberty, male infertility, and risks of hormone supplementation in post-menopausal women are raised.

Sunscreen use was first promoted as preventive medicine more than a half century ago (Lim *et al*, 2004). The pharmaceutical and cosmetic industries have responded to the evident public health need and pleas of the dermatology community by developing highly effective sunscreen products with a superb safety record (Lim *et al*, 2004). Today's consumer can choose from a wide array of formulations and sun protection factors (SPFs); if desired, he/she can readily identify a product that offers very broad spectrum protection and is highly substantive and/or cosmetically elegant. As the skin cancer and melanoma epidemics have progressed, the public has gradually begun to accept the compelling evidence that excessive sun exposure destroys the health and appearance of skin (Montague *et al*, 2001). Cautionary messages abound, however, and sunscreens seem always to remain under a small gray cloud, awaiting the next assault on their safety and efficacy.

Personally, I'll skip the hamburger, apply the sunscreen, and recommend that my patients do the same.

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