



Opinion

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Is Sunscreen Decreasing Our Fertility?



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Opinion

Currently, vitamin D deficiency is considered an epidemic disease that extends to many countries. The main reason for vitamin D deficiency is the lack of sun exposure in moderation given that it is the main source of vitamin D for most people. Foods are naturally lacking in vitamin D, and vitamin D fortified foods are often inadequate to meet daily vitamin D requirements. A circulating level of 25-hydroxyvitamin D of >75nmol/L, or 30ng/mL, is needed to maximize the beneficial effects of vitamin D for health. In the absence of adequate sun exposure, at least 800-1000IU of vitamin D3/d may be needed to achieve this in children and adults [1]. We know that vitamin D deficiency causes rickets in children and will precipitate and aggravate osteopenia and osteoporosis unleashing fractures in adults. In addition, some epidemiological studies suggest that vitamin D deficiency is related to an increased likelihood of common cancers, autoimmune thyroid disease, hypertension and infectious diseases [2-5].

Vitamin D deficiency has been linked to a reduction in female fertility [6]. Some studies suggest that the underlying mechanism may be correlated with decreased levels of anti-Müllerian ovarian hormone (AMH). Another mechanism involved is the relationship between vitamin D values and fertility is the decrease in the products of advanced glycation, insulin resistance and the value of free androgens, its relationship is inverse with BMI, and could be beneficial for the ovulation index and fertility. A recently published randomized double-blind clinical trial demonstrated that an acute high dose of vitamin D3 increased the AMH value of young women [7]. In addition, a cohort study showed that vitamin D3 deficiency is an independent predictor of ovulation and fertility in women with polycystic ovary in induction treatment with clomiphene [8].

On the other hand, a relationship between the hormonal alterations of fertility and chemical products has been proposed. Chemicals such as ethyl hexyl methoxy cinnamate (EHMC), benzophenone-3, phthalates and methyl- and ethyl paraben are considered endocrine disruptors chemicals (EDC) and

are widely used in sunscreens, plastics, building materials, personal care products, insecticides and herbicides [9,10]. The EHMC is associated with antiestrogenic and/or antiandrogenic hormonal activities in fish exposed to water contaminated with sunscreen debris. There was a decrease in the sperm count and oogenesis, and other parameters were altered, such as biased sex ratio, immature gonads, decreased sexual activity, spawning reduction and infertility [11,12]. Likewise, exposure to EDC has been linked in recent animal studies with changes in various fertility parameters in exposed females and in their progeny. It was observed that chronic exposure to EDC, at environmentally relevant doses, modifies the reproductive parameters in female mice [13]. Human studies have shown that women exposed to EDC were up to 6 times more likely to be menopausal compared to non-exposed women [14]. Likewise, when the concentrations of EDC present in the serum were related to contamination of the follicular microenvironment, a decrease in the rate of fertilization and a lower probability of an oocyte becoming a high-quality embryo was found [15].

It has been suggested that the components in sunscreens mimic the effect of progesterone on the acrosome reaction and the penetration of sperm. Then, human exposure to these chemical UV filters could be detrimental to fertility by interfering with the function of the sperm, through the induction of a premature acrosome reaction [16]. In a cohort study in Chile, it was reported that the highest concentrations of monoethyl phthalate and triclosan were associated with earlier menarche among overweight or obese girls [17].

Due to the above findings it is advisable to teach patients about the damaging effect of the extremes, that is, the lack of total exposure to sunlight is as harmful as overexposure. It is necessary to define what should be the adequate state of vitamin D and the appropriate guidelines for solar exposure to UV radiation as well as for the proper use of sunscreens [18]. In that sense, it should be mandatory that public health campaigns on solar protection and dermatologists consider these findings

in order to carry out large epidemiological studies that allow corroborating the relationship between the chemicals present in sun blockers and the decrease in fertility. On the other hand, until these findings are corroborated, consumers of sunscreens could be advised to be alert to ingredients such as ethyl hexyl methoxycinnamate and benzophenone-3, methyl and ethyl paraben and to suggest to the patient natural and chemical-free sunscreens such as organic coconut oil when exposure to the sun is prolonged, given that a range of sun exposure without protection should not exceed 30 minutes, especially if the skin is Caucasian.

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