Do sunscreens have more positive or negative effects?

Study review

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Abstract

Introduction: UV radiation is related to skin cancers, skin photoaging and sunburn. It can be harmful for human skin, so it is crucial to have a protection against sun rays. Substances protecting people from sun are sunscreens, that block and absorb UV radiation. The first sunscreen was discovered in 1928 and, since then, there have been many concerns about its safety, effectiveness and impact on the environment. Types of accessible sunscreens are physical sunscreens, chemical sunscreens and a combination. This study review is performed to assess possible risks of using sunscreens and evaluate if there are more positive or negative effects of their action.

The aim of the study: To evaluate positive and negative effects of sunscreens action.

Materials and methods: We searched Pubmed and ResearchGate in order to find relevant studies about sunscreens and their impact on human skin, human health and environment.

Results: There seem to be some adverse effects of sunblockers for the environment, such as destroying coral reefs, bioaccumulating in fish tissue and water sources. In some studies there was mentioned a negative impact of sunscreens on hormonal systems and pregnancy, as well as on human skin. On the other hand, many studies display that sunblockers inhibit the carcinogenic effect of sun rays, preventing people from developing skin cancers.

Conclusions: Althought sunscreens can have some negative effects, studies showed that there are more positive effects of their action. They can be harmful for the environment, but at the same time they can be a protection. Sunscreens protect skin from developing skin cancer and also delay skin aging. However, the protection against sun is complex.

Key words: skin cancer; sunscreens; protection; environment; sunblockers
**Introduction:** Although light is crucial to humans’ life, it can also be dangerous. In literature, UV radiation is related to about 80% of skin cancers, photoaging of the skin and, of course, sunburn. Sunscreens are substances that block and reflect sun’s rays (ultraviolet radiation), preventing them from penetrating the skin. The first sunscreen was developed in 1928 and since then there are many questions about the safety of sunblockers and how do they influence on the environment. Types of accessible sunscreens are physical sunscreens, chemical sunscreens and a combination of them both. Chemical sunscreens contain chemical compounds, such as octocrylene, avobenzone, and oxybenzone. These substances have implications to be the most allergenic. Physical sunscreens are composed of mineral compounds, such as titanium and zinc oxide. They are classified as natural ingredients.

Most common safety issues regarding the usage of sunscreens include some skin irritations or contact dermatitis; sunscreens also can be comedogenic, causing acne. Of course chemical compounds such as octocrylene or oxybenzone may induce allergic reactions\(^1\).

Also, there were and still are concerns about the influence of chemical compounds contained in sunblockers on fertility and pregnancy. A study\(^2\) showed decreased birthweight and gestational age in neonates if the mother was exposed to oxybenzone during pregnancy.

And what about the influence of sunscreens on the environment? Chemical compounds included within sunscreens are slightly resistive to degradation and can stay detectable in water despite its processing\(^3\). They can also affect coral reefs\(^4\) and can be associated with their

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bleaching (especially oxybenzone). What is more, they can also accumulate in the environment, as they were found in the fish tissues⁵.

On the other hand, there are many studies proving that sunscreens are essential to prevent skin cancer development, delay photoaging and prevent the development of wrinkles. In the case of prevention, studies mean mostly squamous cel carcinoma; there are no further evidence of preventing against basal cell carcinoma (maybe due to its complex and chronic etiology).

However, protection against sun rays is complex and includes not only using sunscreens, but also hats, wearing thick covering clothing, sunglasses and finding shade to not to stay in the sun.

**Purpose:** To evaluate the correlation between sunscreens and their positive effects on human skin, such as diminished prevalence of skin cancer.

**Material and methods:** We did a research using Pubmed and Springer; then we made review and meta-analysis of some interesting studies. We focused on studies describing the effects of sunscreens’ usage.

**Description of the state of knowledge:**

In some studies, sunblockers had a negative impact on the birthweight and gestational age of neonates, thus their safety for pregnant women is still under concern. They also affected coral reefs, destroying them and causing them to bleach, water animals and sources of water in a sense of bioaccumulating. However, there are studies displaying their positive effect on human skin, despite being harmful for the environment.

Studies performed in the 1980s and 1990s displayed that sunscreens play a great role in protecting against damage of the cells, related to the carcinoma development in animal

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models. Experiments shown that sunscreens provided protection against the sun, however the protection depended on the concentration of sunscreen used. All in all, it showed the effectiveness of sunblockers.

Another study showed that sunblockers, if used regularly, delay skin aging. Other, smaller experiment displayed that sunscreens diminish the UV radiation effect on skin such as causing wrinkles and skin lesions or pigmentary changes, preventing skin.

In a big study from Australia the development rate of actinic keratoses in people using sunscreen on a daily basis, that may lead to squamous cell carcinoma, was slightly reduced in comparison with a control group, that used sunblocker for only 1 season.

What is more, there was a study among recipients of organ transplants. It also showed that the usage of a high sunscreen factor prevented skin from the development of squamous cell carcinomas and actinic keratoses. However, in another study, the basal cell carcinomas occurrence was not minimized; it could be because of the chronic etiology of these carcinomas.

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Accordingly to a study\textsuperscript{12}, dermatoheliosis can be reduced if the UV radiation is reduced (for instance by sunscreens) as well, however there are differences between the effects of UVA and UVB radiation on skin.

**Summary:**

Althought sunscreens can have some negative effects, studies showed that there are more positive effects of their action. They can be harmful for the environment and cause some damage to water or coral reefs, but at the same time they can protect humans.

Ultraviolet radiation is known to be very harmful for human skin – it is correlated with skin irritations, wrinkles and skin cancers. On the basis of our analyzes of studies, sunscreens used on a regular daily basis protect skin to a great extent from developing skin cancer. The usage of sunblockers also delays and reduces skin aging. They can help to maintain clear, healthy skin with smaller amount of wrinkles for a long time. However, we should acknowledge that protection against sun rays is very complex. It includes not only using sunscreens, but also wearing hats and thick clothing of dark colours, sunglasses for eyes protection and finding shade during sun hours.

All in all, our health does not only depend on a single thing, like using sunscreens, but many compounds are contributing to staying healthy.

**References:**


