Short Communication

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Could dissociation between eye and skin sun-exposure be a risk for melanoma?

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Abstract

Theoretically, it is investigated why the incidence of malignant melanoma and other skin cancers is increasing, especially in the white-skinned population, despite the fact that people are increasingly using sunscreen cream and wearing sunglasses. The answer is: it is not “although”, but “because”. When these two agents are used, the melanocytes of the skin on the one hand and the nerve cells of the retina on the other hand transfer to the pineal gland the misinformation of low UV radiation. The melatonin secretion is not increased, as it would be actually necessary and adequate. The feedback cycle of the pineal gland becomes dissociated, and the consequence can be cancer.

Introduction

It is common practice in the white-skinned world to wear sunglasses when exposed to the sun, on the one hand, and to apply sunscreen cream to the skin, on the other. In Australia, for example, this is a standard. The minutes of maximum sun exposure are regularly communicated on the radio. However, it is found that this has not reduced the number of melanomas. One could suspect that the theory of reducing the incidence of melanoma in this way might not be correct. The pineal gland’s secretion of its melatonin to tan the skin does not proceed unregulated, but is subject to a feedback mechanism. This means that the melanocytes of the skin on the one hand and the retina of the eyes on the other hand communicate their light and sun exposure values to the pineal gland, which then adjusts its melatonin production accordingly. If the sun exposure messages match, this is not a problem. It is the natural normal condition. In this respect and to this extent, the tanning of the skin and the melanin production in the skin will proceed in a well-regulated manner. There is no significant risk of melanoma development. However, if a person uses sunglasses, the communication from the retina to the pineal gland is no longer adequate to reality, a normal state is feigned. If a person uses a sunscreen cream with a high sun protection factor, the melanocytes transmit information to the pineal gland that does not correspond to reality.

Melatonin [1] Antioxidant Effect of Melatonin: In addition to its function of synchronizing the biological clock, melatonin is a powerful radical scavenger and antioxidant with a broad spectrum of activity [2]. Melatonin is a potent antioxidant that can easily penetrate cell membranes and the blood-brain barrier [3, 4]. As an antioxidant, melatonin is a direct radical scavenger for oxygen and nitrogen compounds such as OH, O2, and NO [5, 6]. Melatonin, together with other antioxidants, also causes an enhancement in the effectiveness of these other antioxidants. It has been documented that the antioxidant effect of melatonin is twice that of vitamin E, and melatonin is believed to be the most effective lipophilic antioxidant. [7] An important feature of melatonin that distinguishes it from other classical radical scavengers is that its metabolites are also radical scavengers, which is referred to as a cascade reaction. Melatonin also differs from other classical antioxidants such as vitamin C and vitamin E in that melatonin has amphiphilic properties. When compared to synthetic antioxidants with effects on the mitochondrion (MitoQ and MitoE), melatonin proved to have comparable protection against mitochondrial oxidative stress [8]. Studies on the effect of melatonin in cancer [9, 10]: The systematic review with a meta-analysis of randomized controlled trials on the treatment of solid tumors with melatonin, which was published in November 2005 in the Journal of Pineal Research, had reduced mortality rates as a result. Melatonin reduced the risk of death within one year to 66% compared to treatment without melatonin. The effect of melatonin was the same at different doses and also for different types of cancer. No serious undesirable side effects were observed. The significant reduction in the risk of death, the low rate of undesirable side effects and the low cost of cancer treatment with melatonin suggest a great potential for the use of melatonin in cancer treatment and prevention.

UV Radiation [11] Effects: UV-A 315-380 nm. Long UV waves

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with lower energy for UV have greater penetration depth into scattering biological tissue and reach the dermis.

Direct pigmentation (conformational change of melanin) - short-term tan lasting only hours, hardly producing light protection,

Damage to collagens - skin loses elasticity and ages prematurely,

Risk of melanoma due to formation of free radicals.

Melanin [12] Melanin serves to protect the skin. Melanin occurs in humans primarily in two variants: a brownish-blackish (eumelanin) derived from the amino acids tyrosine and levodopa, and a lighter yellowish-reddish (pheomelanin) variant that contains sulfur. The melanins in human skin and hair are mixtures of eumelanins and the sulfur-containing pheomelanins. The mixing ratio of these two types of melanin is one of the factors determining a person's skin type. The content of phaeomelanin is particularly high in deep red hair and decreases from brown to black hair. Melanin formation is stimulated by UV radiation and it presumably serves as light protection against the harmful influence of the sun's UV radiation. One of the main arguments in favor of UV protection is the observation that highly pigmented populations suffer from sun-induced skin cancer ("melanoma") to a lesser extent than less pigmented populations. Meanwhile, the photochemical processes that make melanin an excellent UV filter have also been studied. It has been shown that melanin converts more than 99.9% of radiant energy into harmless heat [13], through ultrafast internal conversion from the electronically excited state to vibrational states of the molecule. This ultrafast conversion shortens the lifetime of the excited state. This prevents the formation of free radicals. The excited state of melanin is very short-lived, and therefore it provides excellent photoprotection. Regulation of melanin synthesis according to Ultraviolet radiation: UV exposure leads to activation of melanocytes and increased melanosomes are released (skin tanning).

Nerve cells of the retina [14] A retinal cross-section under the light microscope shows a striking stratification formed by alternating layers rich and poor in cell nuclei. The layers have characteristic cell types and subcellular compartments. Retinal neurons can be divided into three groups:

The light-sensitive or photoreceptive cells, which convert incoming light into nerve impulses. These include the rods and cones and possibly other cell types.

The intermediate cells or interneurons, which subject the generated impulses to initial processing within the retina. These include the horizontal cells, the bipolar cells, and the amacrine cells.

The ganglion cells, which transmit the processed information to the next switching point outside the retina.

The Pineal Gland [15] In mammals, excitations triggered by light stimuli reach the nucleus suprachiasmaticus in the hypothalamus indirectly via the retina and optic nerve. The suprachiasmatic nucleus is the primary chronobiological center of mammals. From here, nerve fibers travel across the dorsal parvicellular subdivision of the nucleus paraventricularis, where they synapse with descending tracts to the spinal cord. These descending tracts travel to the sympathetic root cells (nucleus intermediolateralis) in the upper thoracic medulla. The axons travel back up the head via the cervical part of the sympathetic nervous system (or vagosympathetic truncus) to the superior cervical ganglion. From here, information is directed to the pineal gland [16].

René Descartes (1596-1650), the founder of rationalism, was also interested in the pineal gland. He suspected a direct connection between the eyes and the pineal gland. In the pineal gland he saw the main instance of vision. He believed that this organ coordinates muscle movements with what we see by flowing fluids through tubes between the pineal gland and the muscles ("esprits animaux"). About the pineal gland he said: "There is a small gland in the brain in which the soul exercises its function more specifically than in any other part of the body" (Les Passions de l'âme, art. 31).

Piechowak demonstrated the high blood flow to the pineal gland in 1973: only the kidney blood flow is higher. In 1978, M. Cohen and coworkers published an article in The Lancet suggesting that excessive calcification of the pineal gland might impair its function, which could have significance for the etiology of breast cancer in women. Jenny Redmam showed in 1983 that melatonin injections in rats lead to a shift in their endogenous circadian rhythmicity [17].

Feedback mechanisms [18] The human being is a cybernetic system in which many feedback mechanisms ensure an adequate response to changes. Thus, all hormone glands of the organism are feedback-regulated. The pineal gland reacts on the one hand to the day-night- and seasons-rhythm, i.e. the brightness rhythm, and on the other hand to all inadequate variations such as strong solar radiation. There are two afferents, the impulses from the malanocytes and the impulses from the retina. Without artificial influences, both run in parallel. The retina is protected by the pupil, which narrows at increased irradiation. Melanocyte-stimulating hormones (MSH), also melanotropins, are a group of peptide hormones produced in the hypothalamus and pituitary intermediate lobe that activate the same group of melanocortin receptors In pigment-forming melanocytes, they regulate melanin synthesis as well as melanocyte expansion and pigment dispersion. They limit the fever response. Furthermore, they are involved in the regulation of hunger and sexual arousal.

Problems

Under normal circumstances, the feedback mechanism between skin and retina on the one hand and melatonin on the other hand proceeds undisturbed and adequately to the UV irradiation. Sunglasses lead to a false-low communication from the retina, sunscreen cream to a false-low communication from the melanocytes. The result is an insufficiently low

release of melatonin. The risk of skin cancer increases. If only one of the two sunscreen methods is used, dissociation occurs, the pineal gland gets confused and no longer adequately secretes melatonin. The risk of skin cancer increases. Another problem is the environmental stress on our pineal glands. There are a number of negative impacts: light metals like aluminum and titanium, fluorides, herbicides like glyphosate, and the technical electrosmog esp. of the 5G type. All of them together cause weakening and eventually blocking of the pineal gland, the rhythm is cancelled. This is another factor that is not only responsible for sleep disorders, but also increases the risk of melanoma.

Conclusions

If we want to have a well-functioning pineal gland, the use of a) sunglasses, and b) suntan lotion for the skin are counterproductive. Nature does not have these two methods in its program to protect the skin and the retina. The melatonin production to protect against UV radiation then no longer occurs adequately, the risk of skin cancer increases.

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