Scientific Newsletter

4th edition

An analysis of recently published research in relevant fields

December 2018

European Sunlight Association

Dear ESA Members,

In this fourth edition of the ESA Scientific Newsletter, we present you an overview of the most recent findings in the fields of UV radiation, melanoma and vitamin D as well as an analysis of each of the underlying studies.

In particular, we would like to highlight the discovery of a molecular mechanism that clearly shows the importance of vitamin D in suppression of melanoma cell growth (1st study). Additionally, the overview article on page 4 lists all the health benefits of sunlight, especially its UV part, and condemns the public health messages that urge the public to avoid the sun.

Unfortunately, for some of the studies, only the abstract is freely available - should you be interested in accessing the full version of any of those studies, contact us and we will provide those to you.

Additionally, if you have any questions regarding the studies presented in this newsletter or about any other recently published studies that you believe are worth reviewing in our next edition of the Scientific Newsletter, don't hesitate to contact us.

Have a Merry Christmas and a Happy New Year!

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1st study:

1α, 25-Dihydroxyvitamin D3 alters ectonucleotidase expression and activity in human cutaneous melanoma cells

Bagatini et al., 2018

published in "Journal of Cellular Biochemistry", December 2018

Objective

We hypothesized that **vitamin D** decreases rates of adenosine formation in human cutaneous melanoma cells through the inhibition of extracellular adenosine 5'-triphosphate breakdown, thereby affecting tumor cell viability. Therefore the objective of this study was to explore the mechanisms of action of 1a, 25-dihydroxyvitamin D3 ($1,25(OH)_2D3$) on the activity and expression of ectonucleotidases in cutaneous melanoma cells.

Results

To the best of our knowledge, we showed for the first time a mechanism of control of adenosine production via modulation of the purinergic system in cutaneous melanoma cells treated with the active metabolite of vitamin D. This study provides original information regarding mechanisms, in which **vitamin D plays a key role in preventing tumor progression in human melanoma cells.**

Comment

Even though these results were obtained in an isolated experiment using a melanoma cell line treated with active vitamin D, they can be seen as a strong indicator that **vitamin D plays a central role in our bodies regarding tumor cell growth**. This happens by inhibiting the energy supply of the cell (breakdown of ATP provides energy to all living cells).

In the future, more research is needed to understand the underlying molecular processes even better. Findings like these add to the growing scientific evidence of how **important vitamin D** is for our health and as UV-B is the main source, new public health messages regarding sun behaviour are needed.

More details can be found on the following page.

Commentary

Sun Exposure Public Health Directives

Hoel and de Gruijl, 2018

published in "Environmental Research and Public Health", December 2018

Objective

There have been many **public health recommendations** for **avoiding UV radiation** exposures. This is primarily due to concerns about skin cancer and especially melanoma, the most serious type of skin cancer. However, UV radiation is also known as the primary source of **vitamin D** and other compounds needed for **good health**. This brief commentary lists several of the many important recent studies of adverse health effects associated with low sun exposure, including some specific cancers, multiple sclerosis, diabetes, cardiovascular disease, autism, Alzheimer's disease, and age-related macular degeneration. Our conclusion is that **non-burning UV exposure is a health benefit and—in moderation—should be recommended as such.**

Comment

This commentary is a great summary of why public health messages in regard to **UV light and the sun in general** have to change. It provides a great overview of the many health benefits of sunlight and especially UV light and lists the relevant recently published research as well. Furthermore this short article also condemns that certain groups still preach sun avoidance and completely ignore the dangers of it.

Additionally, the authors clearly demand that **moderate UV exposure should be recommended as it has many health benefits.**

Find the full text here: https://www.mdpi.com/1660-4601/15/12/2794/htm

2nd study:

The Relationships Between Female Adolescents' Media Use, Indoor Tanning Outcome Expectations, and Behavorial Intentions

Myrick et al., 2016

published in "Health Education & Behavior", September 2016

Objective

Unlike other types of cancer, skin cancer incidence rates are on the rise and adolescent females are particularly likely to tan indoors, a major risk factor. However, little research has examined the **role of media use in encouraging or discouraging this dangerous behavior in this population.**

Results

Significant **correlations between media use** and **indoor tanning outcome expectations were found**. Use of interpersonal and social media (i.e., talking on the phone, texting, and online social media) were positively associated with positive outcome expectations about indoor tanning and negatively associated with negative outcome expectations. A path analysis revealed that interpersonal/social media use had indirect associations with indoor tanning intentions via tanning outcome expectations. Mass media use (e.g., news media, entertainment media, and magazines) was not significantly associated with most indoor tanning outcome expectations but did have a direct negative association with behavioral intentions.

Comment

Even though this study was already conducted in 2016 and the target group was limited to female adolescents ages 15-18 years, this study still contains some pretty interesting information about how **media use is influencing the perception of indoor tanning.**

The authors state that "media use would be positively associated with positive outcome expectations (such as appearance benefits, mood enhancement) and negatively associated with negative expectations (such as health threat, discomfort)". More importantly, "indoor tanning intentions were negatively correlated with mass media use but **positively correlated with interpersonal/social media use**" Magazines, entertainement media and news media showed virtually no significant correlation.

This underlines the importance of social media to get the right message out to the broader public. Of course, this is quite specific for a small group but still shows that it has a big influence on the perception of indoor tanning.

3rd study:

Vitamin D Supplements and Prevention of Cancer and Cardiovascular Disease

Manson et al., 2018

published in "New England Journal of Medicine", November 2018

Objective

It is unclear whether supplementation with vitamin D reduces the risk of cancer or cardiovascular disease, and data from randomized trials are limited.

Results

A total of 25,871 participants, including 5106 black participants, underwent randomization. Supplementation with vitamin D was not associated with a lower risk of either of the primary end points. During a median follow-up of 5.3 years, cancer was diagnosed in 1617 participants. A major cardiovascular event occurred in 805 participants (396 in the vitamin D group and 409 in the placebo group.

Supplementation with vitamin D did not result in a lower incidence of invasive cancer or cardiovascular events than placebo.

Comment

This study was picked up by a lot of media, claiming that there were no health benefits, such as prevention of cancer or cardiovascular disease, from taking vitamin D supplements. However, having a closer look into the results, you find for example that there was a **17% reduction in cancer deaths**, which became a 25% reduction when excluding the first two years of follow-up. The **cancer incidence for people with BMI < 25 was also reduced by 24%.**

Additionally, the authors should have based their results on the actual vitamin D levels and not on the doses that were given.

Even though this is a big and important study, there are some flaws that definitely have an influence on the outcome. It is of great importance to ask the right questions before designing a study like this.

4th study

MS Sunshine Study: Sun Exposure but not Vitamin D is associated with Multiple Sclerosis risk in blacks and hispanics

Langer-Gould et al., 2018

published in "Nutrients", February 2018

Objective

Multiple sclerosis (MS) incidence and serum 25-hydroxyvitamin D (25OHD) levels vary by race/ethnicity. We examined the consistency of beneficial effects of **25OHD and/or sun exposure for MS risk** across multiple racial/ethnic groups. We recruited incident MS cases and controls (blacks 116 cases/131 controls; Hispanics 183/197; whites 247/267) from the membership of Kaiser Permanente Southern California into the MS Sunshine Study to simultaneously examine sun exposure and 25OHD, accounting for genetic ancestry and other factors. Higher lifetime ultraviolet radiation exposure (a rigorous measure of sun exposure) was associated with a lower risk of MS independent of serum 25OHD levels in blacks (adjusted OR = 0.53, 95% CI = 0.31–0.83; p = 0.007) and whites (OR = 0.68, 95% CI = 0.48–0.94; p = 0.020) with a similar magnitude of effect that did not reach statistical significance in Hispanics (OR = 0.66, 95% CI = 0.42–1.04; p = 0.071). Higher serum 25OHD levels were associated with a lower risk of MS only in whites. No association was found in Hispanics or blacks regardless of how 25OHD was modeled. **Lifetime sun exposure appears to reduce the risk of MS regardless of race/ethnicity.** In contrast, serum 25OHD levels are not associated with MS risk in blacks or Hispanics. Our findings challenge the biological plausibility of vitamin D deficiency as causal for MS and call into question the targeting of specific serum 25OHD levels to achieve health benefits, particularly in blacks and Hispanics.

Comment

This study, even though it puts the proven benefits of vitamin D in doubts, also demonstrates that there are **other effects triggered by sunlight** that have a positive influence on Multiple Sclerosis and, more general, also on our health. To identify the underlying mechanisms, also in this case, more research needs to be done in the near future.

Find the full text here: https://www.mdpi.com/2072-6643/10/3/268/html

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