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Letter to the Editor

International Panel Expert on "Photoprotection in pediatrica age". March, 01, 2025. Guglielmo Marconi University of Rome, Italy

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Dear Editor,

Organized by the World Health Academy of Dermatology and Pediatrics, at the Guglielmo Marconi University in Rome, an international meeting of experts, including dermatologists and pediatricians, was held on March 1, 2025, to review and discuss photoprotection in pediatric age (Fig. 1, 2).

The meeting was highly successful, both in terms of participation and the relevance of the topics discussed, as well as the high scientific value of the presentations. Prof. Costantino Romagnoli outlined the main issues related to vitamin D, particularly its relationship with sun exposure. Prof. Giuseppe Monfrecola addressed photocarcinogenesis, emphasizing that in recent decades there has been an increase in both skin carcinomas and melanoma and that their prevention must start from the infancy. Prof. Fabio Arcangeli discussed the risk factors for cutaneous melanoma (Fig. 3), highlighting how sunburns during childhood significantly contribute to the development of melanoma in adulthood, and presented studies showing a reduction in melanoma cases among adolescents and young adults following photoprotection campaigns initiated in the 1980s.

Fig. 1. *Meeting program.*

Fig. 2. *Participants: Fabio Arcangeli, Raimonds Karls, Torello Lotti, Giuseppe Monfrecola, Christopher Rowland Payne, Costantino Romagnoli, Giuseppe Ruggiero, Liliana Sytnyk, Uwe Wollina.*

Risk Factors for Cutaneous Melanoma

Genetic

- A family history of melanoma ***RR 1,74**
- Atypical moles > 5 **RR 10,49** ****FAMMM and *****DNS**
- Many moles (N > 60) **RR 3,26**
- Giant Congenital Melanocytic Nevi 2 %
- *Xeroderma Pigmentosus*

Environmental

- *Skin that sunburns easily / Fair complexion* **RR 3,64**
- A history of sunburn (mainly in pediatric age) **RR 2,02**
- Sunbed exposure **RR 2,03**
- Weakened immune system (e.g. HIV)

there is clearly an interaction between genetics and environment

* RR Relative Risk when RS Standard Risk is 1

**FAAMM Familial Atypical Multiple Mole Melanoma nsyndrome

***DNS Dysplastic Nevus Syndrome

Fig. 3. *Risk Factors for Cutaneous Melanoma.*

Prof. Torello Lotti illustrated the most up-to-date phototherapy procedures for certain dermatological conditions (e.g., vitiligo, psoriasis, atopic dermatitis), stressing that, with the abandonment of PUVA therapy, modern phototherapy must meet criteria of relative safety and can only be proposed after the age of 16. Prof. Uwe Wollina elegantly recounted how sun exposure practices have evolved since the early decades of the last century and how the use of sunscreens has spread rapidly. However, paradoxically, sunscreen use alone has not reduced the incidence of skin cancers. Prof. Christopher Rowland Payne also spoke about sunscreens, citing examples of their improper use, such as insufficient application and neglecting areas near clothing. Both experts noted that many organic filters are now considered potentially harmful to human health due to their endocrine-disrupting properties, carcinogenesis stimulation, and potential harm to the environment.

Prof. Raimond Karls emphasized that protective clothing should always be prioritized during childhood. Regular clothing blocks 20% of UV rays (UPF 5), while special fabrics block 80% (UPF 50+). However, uncovered areas should still be protected with sunscreen. Prof. Liliana Sytnyk spoke about the importance of a diet rich in antioxidant foods to enhance natural photoprotection. Finally, Prof. Ruggiero presented the results of an Italian survey involving 107 family pediatricians (caring for 103,255 children aged 0 to 14 years) and 508 parents. The survey revealed a low level of awareness and the need to promote photoprotection education and awareness campaigns.

The Photoprotection Group of the Italian Federation of Pediatricians (FIMP), which promoted this survey, proposed a summary slogan named C.O.C.C.O. (Fig. 4), whose guidelines were approved by the international panel. The final conference document (Appendix 1) subsequently received extensive coverage in both national and international media.

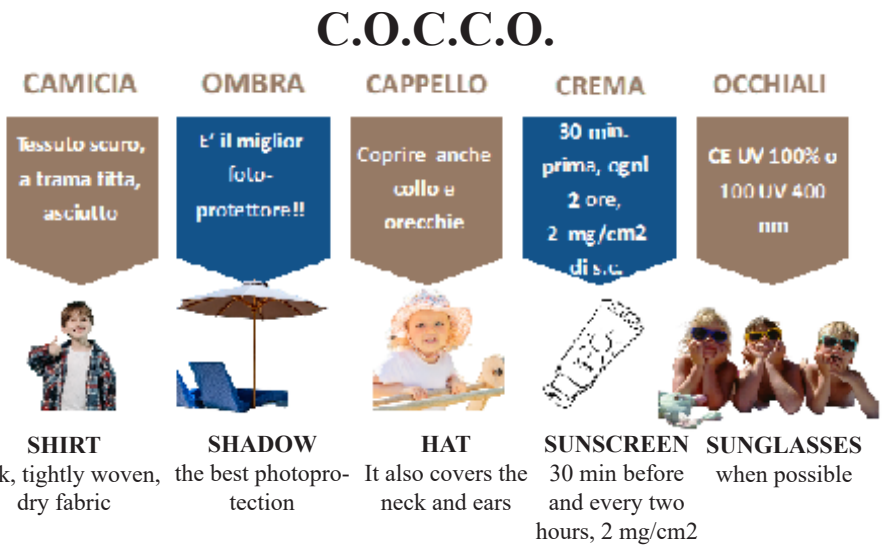

Fig.4. *C.O.C.C.O. guidelines.*

APPENDIX 1

Recommendations for Photoprotection in Pediatric Age

Vitamin D

• Sun exposure is essential for vitamin D production. Vitamin D deficiency is reported in 40-50% of the population aged 0 to 18 years in Italy and Europe. The skin produces 80% of vitamin D following sun exposure (dietary intake accounts for only 20%, of which only 60% is bioavailable). To ensure optimal vitamin D production, it is estimated that 15 minutes of sun exposure to the face and limbs, 2–3 times per week is sufficient.

The Dangers of the Sun

• Excessive and inappropriate sun exposure during childhood is a significant cause, in adulthood, not only of premature skin aging but also of the possible development of squamous cell carcinoma, basal cell carcinoma and cutaneous melanoma: the first one linked to cumulative sun damage, the others linked to repeated sunburns due to excessive acute photoexposures. Both DNA damage from UVB and UVA and immunesuppression UV-induced play a role in human photocarcinogenesis.

Prevention

To reduce the risk of skin cancer (both carcinoma and melanoma), the following measures are essential:
a) Identifying high-risk individuals, such as those with a RHP (Red Hair Phenotyphe) or patients taking immunessuppressive drugs.
b) Implementing effective photoprotection strategies to prevent sunburn and minimize lifelong ultraviolet ray exposure.
c) Following a diet rich in antioxidants (vitamins C, E, A, polyphenols, flavonoids, carotenoids), probiotics and elements such as zinc, selenium, copper.

Photoprotection in Pediatric Age

• Photoprotection in children is crucial and involves more than just applying sunscreen. It is a holistic practice that requires non-pharmacological measures and healthy lifestyle habits. The guidelines from the FIMP Photoprotection Group, known as COCCO (2), are endorsed.

• Infants under 6 months must not be exposed to direct sunlight.

• Children of all ages should avoid sun exposure whenever possible. Unlike adults, children have no desire for tanning and are not motivated to seek sun exposure intentionally.

When sun exposure is unavoidable (e.g. outdoor activities or at the beach) and if the UV index is equal to or higher than 3, the following precautions are recommended:

• Wear protective clothing, preferably in dark colors (darker colors provide better protection), dry fabrics (better than wet), and tightly woven materials

(denim, polyester, or cotton-polyester blends). Technical clothings with a high Ultraviolet Protection Factor (UPF) are ideal as they block approximately 80% of UV rays, unlike regular fabrics which only block 20% of UV radiation.

- Always wear a hat with a wide brim to protect the neck and ears (caps with visors leave these areas uncovered).
- Use sunglasses when possible (CE UV 100% or UV 400 nm) to protect the eyes from prolonged UV exposure.
- For exposed skin apply sunscreen, especially for fair-skinned children, using products with inorganic filters such as zinc oxide. Apply approximately 2 mg/cm² of skin (around 10-15 ml for a 5-year-old) 30 minutes before sun exposure, and reapply every two hours or after swimming.
- Opt for water-resistant, fragrance-free, and biodegradable products in eco-sustainable packaging when available.

Important points:

- Sunscreen should not create a false sense of security, leading to extended sun exposure.
- Avoid sun exposure between 11 am and 4 pm.

Sunscreens

Concerns over the toxicity of sunscreens have been raised by various pediatric associations (1). The use of inorganic filters is recommended during childhood (2) in order to avoid potential allergic reaction or even just hypothetical risks due to cutaneous absorption of organic filters (3). Additionally, these substances could harm the marine environment.

The World Health Organization, Centers for Disease Control, and American Academy of Dermatology continue to recommend sunscreen use for skin cancer prevention (4).

Sunscreens containing the physical filters ZnO and TiO 2 are considered GRASE (**G**enerally **R**ecognized **A**s **S**afe and **E**ffective) by the FDA (Food and Drug Administration) and pose minimal human or environmental safety concerns.

Recommendations:

- Do not use sunscreens under the age of six months
- Prioritize sunscreens with inorganic molecules (e.g., zinc oxide) that are broad-spectrum and stable, but avoid as a precaution formulations with nanoparticles or sprays.
- Combine sunscreens with natural antioxidants and immunostimulant ingredients.

It is recommended that Italian and European health authorities prudentially prohibit potentially harmful sunscreen ingredients and consider classifying sunscreens as drugs (as in the USA) rather than cosmetics, ensuring rigorous evaluation of their safety and efficacy.

Heliotherapy and Phototherapy

- Certain skin conditions (e.g., vitiligo, psoriasis, atopic dermatitis) may improve with sun exposure or artificial light. Heliotherapy should follow the guidelines mentioned earlier.
- Phototherapy, recommended only after the age of 16, may include UVB-NB (311 nm), excimer laser, and UVA-1 (355 nm) treatments. Photochemotherapy (PUVA) should only be considered if other treatments fail.

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