

Measurements of solar ultraviolet B radiation reaching the ground in southern Italy

[Monitoraggio della quantità di ultravioletto B solare sull'Italia meridionale]

Del Sorbo, A.^a,
Procaccini, E.M.^a,
Prizio, E.^a,
Riccardo, A.M.^a,
Russo, I.^a,
Monfrecola, G.^{ab}

^a Sezione di Dermatologia, Dipto. di Patologia Sistemica, Università di Napoli Federico II, Napoli, Italy

^b Clinica Dermatologia, Università Federico II, via S. Pansini, 5, 80131 Napoli, Italy
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Abstract

Objective: aim of this study was been the evaluation of daily and monthly changes of solar short ultraviolet (UVB) in a central Mediterranean area (Naples city, 40.8623° North) from 1997-2002. **Materials and methods:** the measurements were automatically collected and expressed as physical units (mW/cm^2) and biological units (Minimal Erythema Dose/hour = MED/h). The irradiance unit may be converted to UV Index (UVI) by the conversion factor: 1 [MED/h] = 2.3 on the UVI scale. These values were processed with a special software Solar Light IDL 2.0 that informed us about current UV dose, accumulated UV dose, current UVI, peak UVI, time until sunburn, expressed in mins. Moreover, we studied these parameters by means of a statistical data analyser software called SPSS version 10.0 to obtain information about average values in this last 5 years of measurements. **Results:** the results showed that: i) the sporadic peaks of maximal irradiance occurred in June; ii) the maximal value of the monthly mean irradiance was observed in June-July, while the minimal one in December-January; iii) the amount of solar UVB that reaches the ground and therefore our skin during the last 5 years has been unmodified. About 20-30% of total daily UVB is received during the interval of time between 60 mins both before and after midday in summer, with 75% between 9 am and 3 pm. In Naples during the summer, half an hour of midday sun exposure of the unacclimatized skin of Caucasian subjects is normally sufficient to result in a subsequent mild reddening of the skin. We report that in Naples the average UVB sunstroke is equal to about 2 MED/day in winter; 7 MED/day in spring and in autumn, 12 MED/day in summer. According to Diffey algorithm, in Naples annual MED is about 2600, and these values have been confirmed by our measurements (2676 MED in 1998, 2591 MED in 1999, 2724 MED in 2000, 2612 in 2001, 2634 in 2002). **Conclusions:** our results show that erythema could appear, in individuals with skin type II and III living in a touristic Mediterranean area, after about 30 mins of sun exposure, in July; ii) the

sunburn risk is higher just during the months when skin hasn't yet acquired the natural defences to respond to the peak of UVB. This monitoring may give more information about photodermatitis, photocarcinogenesis and some preventative devices of exposure to sun rays.