

The impact of patterns of vacation sun exposure on the development of acquired melanocytic nevi in 6-7-year-old German children

Ecke J¹, Pfahlberg A¹, Lederer P², Uter W¹, Gefeller O¹

¹*Institut für Medizininformatik, Biometrie und Epidemiologie, Universität Erlangen-Nürnberg, Deutschland*

²*Gesundheitsamt der Stadt Erlangen und des Landkreises Erlangen-Höchstadt, Deutschland*
jasmin.ecke@imbe.imed.uni-erlangen.de

Sun exposure has been found to be the main environmental risk factor for the development of both, cutaneous malignant melanoma and melanocytic nevi. While the association between high levels of sun exposure and an elevated number of melanocytic nevi is not disputed, the interplay between intense intermittent and the cumulative amount of sun exposure in defining the promoting effect on melanocytic nevi development is an area of debate.

The cross-sectional study NAEVAC investigated the determinants of acquired melanocytic nevi since birth among 6-7-year-old children in two German centers. From November 2001 to April 2002 2,189 children were recruited during their mandatory health examination prior to school enrollment in Salzgitter, Lower Saxony, and Erlangen-Höchstadt, Bavaria. Total body counts of melanocytic nevi were ascertained by trained staff members. Personal interviews of the parents provided information about a variety of exposure factors.

The distribution of melanocytic nevi was skewed markedly to the right; therefore, a negative binomial regression model provided the appropriate framework for a multivariable analysis. Neither the frequency of vacation periods nor the cumulative duration of vacations in areas with a low ultraviolet radiation were significantly associated with the total number of melanocytic nevi. Therefore, multivariable analyses were limited to variables concerning vacations with an intense ultraviolet radiation. Altogether, three multivariable regression models were analyzed. In the first model the frequency of vacation periods in areas with an intense ultraviolet radiation as the exposure variable of interest was included, in the second model this variable was replaced by the cumulative duration of vacations in areas with an intense ultraviolet radiation and in the third model a variable combining cumulative duration and frequency of vacations in areas with an intense ultraviolet radiation was applied.

Each of the three variables showed a significant influence on the number of melanocytic nevi when integrated in the model, yet, the gradients of the percentage change in nevi number relative to the reference category were rather different for the three variables. In the first model a clear gradient showing an increasing number of melanocytic nevi with ascending number of vacation periods could be detected. The second model initially showed a positive trend concerning an increasing number of melanocytic nevi with an increasing cumulative duration of vacations, but with a further increase in the cumulative duration of vacations the nevi numbers at first remained stable and then turned upwards. In the third model a steep gradient with respect to the (adjusted) number of melanocytic nevi was apparent for the frequency of vacation episodes associated with sun exposure in areas with an intense ultraviolet radiation even within the subgroups defined by the categories of the cumulative duration of vacations.

Our findings give credit to the hypothesis that especially intermittent exposure to high doses of ultraviolet radiation plays an important role in the development of melanocytic nevi.