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Abstract

Vitamin D and skin aging

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Background

The relationship between 25- hydroxyvitamin D and different phenotypes of skin aging (e.g., wrinkles, pigmented spots, telangiectasia, perceived age) is unclear. We investigated the association between vitamin D levels and skin aging phenotypes in middle- aged participants from the Rotterdam Study (RS) and Leiden Longevity Study (LLS).

Methods

Standardized facial photographs were taken of North- European participants from the RS (N=3,831; 58.2% female, median age 66.5) and the LLS (N=661; 50.5% female, median age 63.1). Facial wrinkles, pigmented spots and telangiectasia (RS only) were quantified either digitally (RS) or by two independent dermatologists (LLS). Perceived age was graded by an average of 27 (range:20- 30) and 60 (range:59- 61) assessors in the RS and LLS respectively. The associations between vitamin D and these phenotypes (all standardized using Z- scores) were investigated using multivariable linear regression analyses, adjusted for chronological age, sex, self- reported UV- exposure, season, smoking, body mass index and skin color, followed by meta- analysis of the two cohorts.

Results

Higher circulating 25- hydroxyvitamin D was associated with more wrinkles (P- value<0.0001) and a higher perceived age (P- value<0.0001). However, there was no association between higher circulating 25- hydroxyvitamin D and pigmented spots or telangiectasia (p- values>0.05). Self- reported UV- exposure was associated with all four phenotypes. In RS, a light skin color was associated with more pigmented spots (P- value<0.0001) and telangiectasia (P- value<0.0001), but with less wrinkles (P- value<0.0001).

Conclusion

A higher circulating 25- hydroxyvitamin D is associated with more facial wrinkles and a higher perceived age in middle- aged and older individuals. However, although statistically adjusted for questionnaire- based sun exposure, these two associations could be attributable to residual confounding.