Exposure to Sunlight and Vitamin D Synthesis

Sir,

I read with interest, an article by Patwardhan et al.\(^1\) published in your journal. It is commendable to note that the authors have put in effort to validate questionnaire to estimate sunlight exposure and then correlate the same with vitamin D status. But authors mention ‘Nevertheless, the association of UV exposure with serum 25(OH)D concentrations in Asian adults from tropical climates like India, where angle
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and latitude are favourable for receiving optimal sunlight, has to the best of our knowledge not been reported so far which is far from truth.

A study from south Indian city, Tirupati (latitude 13.40°N and longitude 77.2°E) using in vitro ampoule model with precursors of vitamin D (7-dehydrocholesterol) when exposed to sunlight demonstrated best conversion to active vitamin D between 11 A.M. to 2 P.M. clearly proving the efficacy of sunlight in vitamin D synthesis. The median percentage conversion of 7-dehydrocholesterol to pre-vitamin D3 and its photoproducts and percentage of pre-vitamin D3 and vitamin D3 was shown to be 11.5% and 10.2% respectively at a solar zenith angle of 36.8° and at 12:30 P.M.[3]

Vitamin D surveys from rural south India (Tirupati) by Harinarayan et al.,[3] have similarly demonstrated higher vitamin D levels in agricultural workers who are exposed to long hours of sunlight as part of their work compared to urban dwellers (~24 ng/mL vs 19 ng/mL) establishing positive correlation between exposure to UV rays from sun and serum vitamin D levels.

In another study from north India,[4] authors compared serum 25(OH) D and bioavailable 25(OH) D in males with varying durations of sun-exposure between indoor and outdoor environments in Delhi during August–September. They demonstrated that serum 25(OH)D increases by 2.03 ng/mL per hour of sun-exposure (95% confidence interval 1.77–2.28; P<0.001). Also they found that outdoor workers with prolonged sun-exposure were vitamin D-sufficient, with higher serum bioavailable 25(OH) D than the indoor workers during summer.

Studies from Pune (latitude 18.31°N and longitude 73.55°E) involving current authors,[5] themselves have shown that toddlers (of course not adults in this case) exposed to sunlight (playing outside) for more than 30 min a day exposing more than 40% of their body surface area have a normal vitamin D status (males: 91.6 nmol/L and females: 67.7 nmol/L) which was three times more compared with the toddlers who were indoors for most part of the day (males: 32 nmol/L and females: 21.1 nmol/L).[5] A similar association is proven across India in adolescent school children aged 10–15 years by Marwaha et al.[6]

In a dose–response study by Mark et al.,[7] healthy adults of South Asian ethnicity (n = 60; 20–60 years old) while wearing casual clothes that revealed a 35% skin area were exposed to ultraviolet rays equivalent to 15–90 min unshaded noontime summer sunlight at 53.5°N (Manchester, United Kingdom), three times/week for 6 weeks. They demonstrated that participants who received exposures equivalent to 45 min unshaded sunlight (n = 33) attained a mean (±SD) rise in 25(OH) D concentration of 8.7 ± 5.7 ng/mL (95% CI: 6.8, 10.6 ng/mL; P < 0.001), and 94% of subjects achieved concentrations >10 ng/mL proving an association between sunlight exposure and vitamin D status.

I think the association between sunlight exposure and vitamin D synthesis is well established in south Asians especially Indians. Hence, author’s claim of novelty of data presented with regards to this association is not true and is ill-founded.

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Conflicts of interest
There are no conflicts of interest.

Srinivasa P. Munigoti
Department of Diabetes and Endocrinology, Fortis Hospital, Bannerghatta Road, Bengaluru, Karnataka, India

Address for correspondence: Dr. Srinivasa P Munigoti, Consultant Endocrinologist, Department of Diabetes and Endocrinology, Fortis Hospital, 154/9, Bannerghatta Road, Opposite IIM-B, Bengaluru - 560 076, Karnataka, India. E-mail: spmunigoti@gmail.com

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