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Comment

## ***Interactive comment on “Utilising shade to optimize UV exposure for vitamin D” by D. J. Turnbull and A. V. Parisi***

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The manuscript argues the advantage of shade for optimising exposure to UV radiation for Vitamin D production versus the harmful effects due to high exposure of UV Radiation. The manuscript argues that a shaded environment enhances the UVA reduction (in part responsible for erythema), while reducing UVB to a lesser extent (responsible for Vit. D production). However the measurements are discussed with respect to erythemal doses, using a dose of 1/3 MED as optimum for Vit D production. This approach therefore neglects the spectral differences between the erythemal and Vit D action spectrum which is originally used by the authors to justify their investigation. As stated by Rev 1, the current argument boils down to the statement that diffuse UV radiation reduces UV exposure., which by itself is not sufficient to justify publication.

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To provide quantitative arguments to justify the manuscript title of using shade to optimize UV exposure for Vit. D production, the authors need to analyse their data using the Vit D erythral action spectrum as done in Figure 1b) for the whole data set shown in Figures 2 and 3. The dose of 1/3 MED can also be used in this frame to determine the optimum time to stay in the shade. Following this approach, the following information can be obtained: 1) Time period until Vit D dose is produced, equivalent to 1/3 MED 2) Corresponding time for reaching 1/3 MED based on the erythema action spectrum. This latter information is currently presented in Figures 2 and 3.

The comparison between 1) and 2) for shaded and unshaded exposure respectively should show that the time needed to reach 1/3 MED for Vit D during shaded exposure will be shorter than the corresponding time needed to reach 1/3 MED for eythmal weighted exposure with respect to the unshaded environment.

As argued by Rev 2, a table should be included which summarises the respective results for shaded and unshaded environments.

In that table, one could also add the time required to reach the optimum Vit D level by exposing more than the 15% body surface as currently used by the authors. While the time to reach 1 MED will not change, increasing the exposed body surface (by wearing shorts and possibly removing a shirt) would consequently decrease the time needed for Vit D production. For example increasing the exposed body surface to 50% would decrease the optimum expsoure times calculated in this manuscript by a factor of three, enhancing the safe exposure period before reaching 1 MED.

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