Reviewer's report

Title: A retrospective cohort study on the influence of UV index and race/ethnicity on risk of stress and lower limb fractures

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Reviewer: roger bouillon

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The authors explored whether possible exposure to UVB, calculated on the basis of region of origin, would have an effect on stress fracture incidence in US Army personals exposed to combat training.

Strength of the Ms: very large data base - plausible hypothesis – detailed analysis

Weaknesses: no proof that the hypothesis, potential UV B exposure indeed is associated by better vitamin D status, nor in the data analysis nor in published literature. Indeed it is far from obvious from other studies in the US that region and potential UV B exposure is tightly or even poorly correlated with 25OHD levels. This aspect should be much better discussed as the authors assume that this association is accepted and proven.

The evidence for a role on vitamin D and or calcium on stress fracture risk is best assessed by RCT and this aspect is lacking in the introduction or discussion.

Moreover previous studies in the US and in Israeli soldiers evaluated multiple risk factors and showed at least 5-10 predisposing factors to be involved. So I am surprised that the authors did not from the start plan such multiple factor analysis. Moreover a case control 25OHD measurement would have been very helpful especially as probably a serum bio bank is available for a large number of these recruits.

If there would be a threshold for vitamin D status, (and thus with UVB exposure) followed by a plateau effect on stress factor risk, then the whole analysis would not be able to detect such effect.

It would be very informative to compare the risk of fractures of this population with that of the general population of that age/gender/race.

Minor comments: in the Abstract it should be clearly mentioned that the Ms deals with US military personnel

In the discussion the authors should use either 25OHD levels or vitamin D status but not vitamin D levels as this was not measured.

Level of interest: An article of importance in its field
Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

no conflict of interest