

Seasonal changes of the vitamin D status in AlpTransit underground miners

Project: 371

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Background:

Insufficient sun exposure is a major cause for vitamin D deficiency (VDD). Underground miners experience a professionally enforced sun deprivation and might therefore have a higher risk for VDD.

Objectives:

To assess the vitamin D status in underground miners as compared to a light and dark skinned control population in the same geographical area in spring and fall.

Design:

In this cross-sectional study vitamin D status (25(OH) vitamin D plasma concentration, parathormone, calcium, phosphate plasma concentration and different questionnaire based parameters for the level of sun exposure were studied in 22 miners at the AlpTranit tunnel construction site in the Swiss Alps (geographic location: 8° 40' East / 46° 46' North) and 32 light and dark skinned controls (19 Caucasian / 13 African). Participation was volunteered.

Results:

In spring/fall 31.8%/0% of miners, 21%/42% of white skinned and 61.5%/30.7% of dark skinned persons had a severe vitamin D deficiency (defined as a serum 25(OH)-vitamin D concentration < 25 nmol/L). The corresponding numbers for mild VDD (defined as a serum 25(OH)-vitamin D concentration > 25 nmol/L and < 50 nmol/L) were 27.2%/9.1. % for the miners, 63.2%/42.1% for white skinned and 38.4%/61.5% for the dark skinned controls.

Conclusion:

Underground mining is a situation of enforced sun-deprivation and has to be regarded as a high risk situation for vitamin D deficiency. Our data suggest that in motivated and apparently self-responsible miners the handicap of enforced sun-deprivation can be partially counterbalanced by increased sun-exposure. The constellation of our data are suggestive that the combination of dark-skin and underground work would increase the risk of vitamin D deficiency.