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BOOK OF ABSTRACTS Open Access

Assessment of Serum 25 (OH) Vitamin D Status in Elite Portuguese Cycling Athletes

Amorim S[1]✉; Quintas F; Mendes G; Araújo JP; Loureiro N.

Abstract

Introduction: It is recognized that vitamin D has multiple effects in health (Autier, Boniol et al. 2014) and in athletic performance (Ogan and Pritchett 2013). It has been shown that it may have a role in the immune function, protein synthesis, inflammatory responses, regulation of cell growth and skeletal muscle physiology. However, vitamin D deficiency is common either in general population (Holick and Chen 2008) as in athletes (Farrokhyar, Tabasinejad et al. 2014). The endogenous synthesis via ultraviolet-B radiation through exposure to sunlight is the major source of vitamin D in humans. The 25(OH) Vitamin D is used as the clinical measure of vitamin D status (Willis, Peterson et al. 2008). However optimal concentration thresholds are not yet well determined.

Purpose to assess the vitamin D status of elite Portuguese cycling athletes.

Methods: This study was conducted with a group of 65 elite Portuguese cyclists of different ages and modalities (road cycling, mountain bike - cross-country and mountain bike - downhill), selected from the Portuguese national team. All athletes were resident in mainland Portugal at latitudes 37-42°N. Over five months, from April to August 2014, peripheral blood samples were collected to assess serum levels of 25 (OH) vitamin D in the fasted state. Levels were classified in: deficit (<20 ng/ml) insufficient (20-32ng/ml) and sufficient (> 32 ng/ml). Data were collected and analyzed in SPSS ® version 20.

Results: The sample had a mean age of 21 ± 5,1 years. Most athletes were male (73,8%) and road cycling practitioners (56,9%). We found 4 athletes with 25 (OH) vitamin D deficits, 3 of them perform mountain bike - cross-country and 1 mountain bike – downhill (table 1). 25 (OH) vitamin D mean value was 29,2ng/ml ± 7,1. As shown in Fig.1 only 36,9% of the cyclists had a sufficient value of 25 (OH) vitamin D. The athletes blood samples were preferentially collected in April (33,8%) and June (24,6%). August was the month with fewer athletes evaluated (6,2%). We found no difference between the mean value of 25 (OH) vitamin D between genders [t(63)=0,853; *p*=,398]. There was a weak positive correlation between age and 25 (OH) vitamin D levels, however with no statistical significance (r=0,107; *p*=0,395). We found a statistical significant positive correlation between collection month and 25 (OH) Vitamin D levels (r=0,426; *p*<0,001).

Discussion: The cyclists who participated in this study trained outdoor, however the results show that the vitamin D status is far from being the most suitable. We have to realize that, despite the sunny days in winter months, the cyclists wear more clothes to protect every part of the body from cold during the outdoor training session. So, the ultraviolet-B radiation will not be so effective during this period of time. As already mentioned (Cannell, Hollis et al. 2009), the values of vitamin D rise gradually by March till September, then the values starts to decrease again. If we consider the cut-off used in a recent meta-analysis (Farrokhyar, Tabasinejad et al. 2014) of vitamin D inadequacy in athletes we could say that 63,1% of our cyclists had a value of vitamin D inadequate, that is, almost two in each three cyclists. Considering other studies made with cyclists, our results are very similar. A French study (Guillaume, Chappard et al. 2012) with twenty nine professional road cyclists and a mean of 26,5 years, from a team who participated in the *Tour de France,* showed a mean value 29,8ng/ml ± 11,0 of 25(OH) Vitamin D . The blood samples were collected in different periods of the season. Similar results were obtained (Lombardi, Corsetti et al. 2014) from nine professional road cyclist of an Italian team during the *Giro d'Italia* 2011 in three periods of time of this competition between May 08 and May 29. The mean results were between 28,3ng/ml ± 5,1 and 33,7ng/ml ± 5,0 More recently, the results from a sample of twenty Spanish cyclists (Valtueña, Dominguez et al. 2014) indicate a mean value of 25(OH) Vitamin D much lower. The mean value is 20,9ng/ml ± 7,3. However, the date of analysis is not mentioned. In our sample we had three different types of cycling modalities. Unfortunately, it was not possible to compare the mean value of 25(OH) Vitamin D between the different modalities due to the small sample (mountain bike - downhill) and to the different collection date (road cycling mostly in June/July and mountain bike only in April and May).

Conclusions: Physicians and sports nutritionists working with cyclists should consider to analyze serum 25 (OH) Vitamin D concentrations in winter and spring months. Supplementation with vitamin D is recommended in cyclists with low value of 25(OH) Vitamin D.

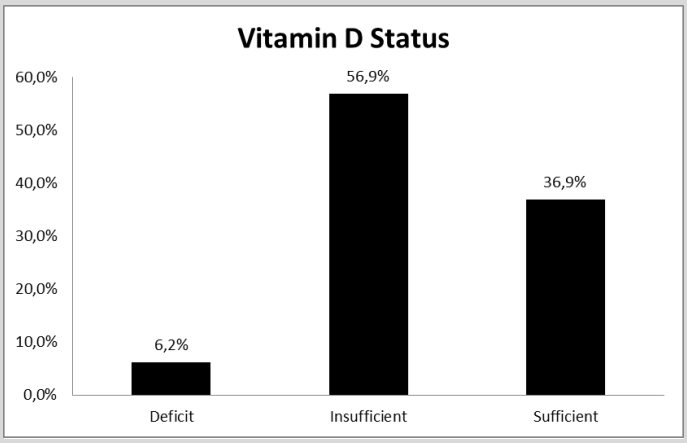

Figure 1. Vitamine D status

Table 1. Characteristics of the sample.

	Road Cycling	Mountain Bike – Cross-country	Mountain Bike - Downhill
Men (n)	28	17	3
Women (n)	9	7	1
Mean age (years)	21,7	19,8	21,5
Mean 25(OH) Vitamin D (ng/ml)	30,9	27,3	25,0
Vitamin D Status (n): Def/Insuf/Suf	0/19/18	3/11/10	1/2/1
Collection month (April/May/June/July/August)	4/1/16/12/4	16/8/0/0/0	2/2/0/0/0

✉ **Contact email amorimsamuel@gmail.com** (S. Amorim)

[1] Portuguese Cycling Federation, Medical deparment