



## Opinion

# COPD and low plasma vitamin D levels: Correlation or causality?

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Chronic obstructive pulmonary disease (COPD) is the third leading cause of death and its prevalence and incidence is also related to smoking behavior [1]. COPD is still a chronic inflammatory and progressive disease caused by multifactorial agents including environmental pollutants [2]. Besides that, it is emerging that endogenous epigenetic factors induced by lifestyle and environment [3] could play a role in the etiopathogenesis of the disease [4].

In the last years, several authors suggested that low vitamin D levels seem to be related with the increase of COPD manifestations [5]. Moreover, a multicentre, double-blind, randomised controlled trial documented that vitamin D supplementation protects against moderate or severe exacerbation of the disease, but not by upper respiratory infections [6]. However, low levels of vitamin D can be extended to many other diseases, including multiple sclerosis, diabetes, colon rectal cancer, headache or drug use [7-11]. Moreover, it is also important to remember that Vitamin D deficiency is common in high latitude regions, such as northern Europe, New Zealand, northern USA, and Canada where weaker ultraviolet B rays is not able to produce enough vitamin D. Finally, methodological factors (using low sensitivity methods) could contribute to misleading evaluation of circulating vitamin D levels. In any case, here we shall remind that vitamin D has a fundamental role in immunity [12]. In particular, it has been reported that vitamin D is able to shift the pro-inflammatory T-helper cell 1 to anti-inflammatory T-helper cell 2 [13]. Therefore, benefits of vitamin D supplementation in chronic diseases which directly or indirectly affect immune system are obvious. Today, the burden of COPD in never smokers is higher than previously believed. Therefore, more research is needed to unravel the characteristics of non-smokers COPD [1]. Notably, vitamin D levels are reported to be significantly lower in smoker's subjects than in non-smokers ones [14]. Therefore, low plasma vitamin D levels in COPD seems to be more a causality than a correlation.

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