Vitamin D deficiency is a sign of poor health in chronic obstructive pulmonary disease

Vitamin D is an important hormone in growth and bone metabolism. Vitamin D deficiency is highly prevalent worldwide and causes growth retardation and rickets in children and osteomalacia in adults. However, the role of vitamin D deficiency in human health has been extended well beyond conditions affecting bones. Vitamin D deficiency has been linked with lung function impairment and development of chronic obstructive pulmonary disease (COPD), a disease characterised by presence of chronic inflammation in the lungs and airways leading to deterioration of health due to airway obstruction and respiratory symptoms. In this context, we investigated whether vitamin D deficiency has an importance for individuals with COPD with regard to their prognosis. For this purpose, we identified individuals with chronic obstructive pulmonary disease from among 35,153 individuals participating in a health survey and followed them for up to 36 years to assess their risk of death, complications, and comorbidities according to their vitamin D levels in blood.

We found that low levels of vitamin D in blood were associated with an increased risk of death in individuals with COPD. Half of individuals with normal vitamin D of 50 nmol/L or higher died before age 80 years, while in comparison half of individuals with severe vitamin D deficiency of less than 12.5 nmol/L died before age 70 years, corresponding to 10 years shorter life expectancy. After taking differences in age, sex, and other related lifestyle factors smoking, alcohol, weight, physical activity into account, those with severe vitamin D deficiency of less than 12.5 nmol/L had a 35% increased risk of early death compared to those with normal vitamin D levels of 50 nmol/L or higher. No clear pattern could be observed with regard to cause of death; however, there may be an increased risk of death due to respiratory disease and cancer. Furthermore, we found that risk of pneumonia and hip fractures were increased in those with vitamin D deficiency compared to those with normal vitamin D. We believe that low concentrations of vitamin D in blood is a marker of poor health in COPD.

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