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Letter to the Editor

Vitamin D supplementation: An innovative way to prevent asthma exacerbation in developing countries?

Dear Editor,

Asthma is a major non-communicable disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. It is increasing at an alarming rate in developing countries and has become a public health problem with a powerful impact on the general health and economy of these countries.

On October 3, 2017, a study was conducted that found that vitamin D supplementation can reduce the chance of life-threatening asthma attacks by half.[1] The study compared vitamin D supplementation with placebo in people with asthma. The main outcome of interest was concerned exacerbated incidences of asthma being treated with oral steroids. Vitamin D supplementation resulted in a 26 per cent reduction in the rate of asthma attacks requiring treatment with steroid tablets or injections. It also reduced the risk of experiencing at least one asthma attack requiring a visit or admission to casualty by 50 per cent. Researchers found that patients with low vitamin D levels experienced the greatest benefit from vitamin D supplementation. Vitamin D supplementation was found to be safe for participants at the doses that were being used and did not increase the risk of serious adverse events. On the other hand, these findings cannot be generalized to children and individuals with more severe asthma because the majority of subjects were adults with mild to moderate asthma. On November 9, 2017, a cohort study was published that concluded that vitamin D deficiency favoured exacerbations of asthma symptoms and that these symptoms decreased after long-term vitamin D replacement.[2] Another study concluded that vitamin D could be beneficial for the prevention and therapy of important lung diseases, including asthma.[3] This effect of vitamin D is probably because, in acute exacerbation of asthma, bronchial smooth muscle contraction (bronchoconstriction) occurs quickly to narrow the airways in response to exposure to a variety of stimuli, including allergens, irritants, or stress. The mechanism involved may include enhanced generation of pro-inflammatory cytokines. Vitamin D suppresses T-cell proliferation, affects T-cell maturation, and facilitates the induction of T regulatory cells, resulting in decreased production of pro-inflammatory cytokines with increased production of anti-inflammatory cytokines.[4]

Vitamin D is a fat-soluble vitamin that regulates calcium and phosphate absorption from the gastrointestinal tract and kidneys, modulates bone health, and plays an important role in immune regulation. It exists in two forms, vitamin D2 (ergocalciferol), which is found in plant sources, and vitamin D3 (cholecalciferol), which is the main dietary source of vitamin D and is present mostly in oil-rich fish, dairy products, orange juice, soy milk, cereals, beef liver, cheese, and egg yolks. Because vitamin D is a fat-soluble vitamin, ingested vitamin D is incorporated into chylomicrons, which are absorbed into the lymphatic system and enter the venous blood. However, a major proportion of vitamin D is also produced endogenously in the human skin from 7-dehydrocholestrol through exposure to natural sunlight.[5]

Vitamin D deficiency is a global public health problem in all age groups, particularly in Middle Eastern populations[6] where there is a high prevalence of vitamin D deficiency due to decreased exposure of sunlight for females, customs concerning children and the elderly, and other social, cultural, and lifestyle factors. Vitamin D deficiency is also associated with increased risk for many cancers such as colorectal carcinoma.[7,8] Its deficiency has also been attributed to increased risk for many diseases such as autoimmune diseases, including systemic lupus erythematosus, rheumatoid arthritis, multiple sclerosis, and respiratory infections.[9]

Supplementing with vitamin D could significantly aid the prevention and treatment of asthma and other respiratory infections. This can be achieved very easily, as it is found in many common products. Though only a small proportion of vitamin D is obtained from dietary sources, food and supplements are important sources as well, especially among urban populations and people who work indoors. In

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developing countries, where most of the population is from lower or middle classes and where government hospitals are very limited, people cannot afford repeated hospital admissions in private setups. The use of supplementation would decrease hospital admissions, and hence, expenses. An adequate exposure of 10–30 min of sunlight daily is the easiest and cheapest way to supplement with vitamin D. Midday, especially during summer, is the best time to get sunlight. Another problem with patients is their compliance with medicine protocols. Making people aware that a limited exposure to sunlight is all they need would ease their life. Also, patients will be comforted by natural therapy and be relieved off from anxiety regarding the side effects of medicines, which is a major reason for non-compliance. Educating people, especially females who usually prefer going out in the evening, to take a morning walk would be very helpful in decreasing hospital admissions for asthma.

Conflict of interest

The author declares no conflict of interest.

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