

Correspondence

Vitamin C and asthma

To the Editor:

Moreno-Macias and Romieu¹ reviewed the possible role of antioxidants in asthma, but they did not properly cover randomized controlled trials (RCTs) on vitamin C and asthma. Mitochondrial respiration and inflammatory cells are an endogenous source of oxidative stress,¹ and therefore, the pulmonary effects of vitamin C might be most pronounced when a person exercises or suffers from infections.

Three RCTs examined the effect of vitamin C on asthmatic participants suffering from exercise-induced bronchoconstriction (EIB).² The pooled relative effect estimate revealed a 48% reduction (95% CI, 33% to 64%) in postexercise FEV₁ decline when 0.5 to 2 g/d of vitamin C was administered before the exercise test.² One of the trials reported that on the placebo day, 100% (20 of 20) of the adolescent participants suffered from EIB, whereas on the vitamin C day, only 50% (10 of 20) of them suffered from EIB ($P < .001$).³ The 3 RCTs included a total of only 40 participants, but the studies were carried out over 3 different decades and on 2 different continents, and the inclusion criteria differed. Still, all 3 trials were consistent with vitamin C halving the postexercise FEV₁ decline. Therefore, the effect estimate may be valid for several other asthmatic patients who suffer from EIB.

A systematic review found 2 RCTs that provided information on the potential pulmonary effects of vitamin C in sufferers of common cold-induced asthma.⁴ A trial in Nigeria examined asthmatic patients whose asthma exacerbations resulted from respiratory infections ($N = 41$). A vitamin C dose of 1 g/d lowered the incidence of severe and moderate asthma attacks by 89% (95% CI, 52% to 98%; based on 23/19 vs 3/22).^{4,5} A cross-over study in former East Germany on patients who had infection-related asthma ($N = 23$) found that 5 g/d of vitamin C decreased the prevalence of bronchial hypersensitivity to histamine by 52 percentage points (pp) (95% CI, 25 pp to 71 pp; based on 91% during the placebo phase vs 39% during the vitamin C phase).^{4,6}

None of the 5 above-mentioned double-blind placebo-controlled RCTs was mentioned by Moreno-Macias and

Romieu,¹ who mainly focused on case-control and cohort studies. They referred to a 4-month RCT on 154 British asthmatic patients that found that the FEV₁ level was not influenced by 1 g/d of vitamin C.⁷ This British RCT implies that vitamin C supplementation does not influence pulmonary functions in patients with stable asthma; however, vitamin C may beneficially affect pulmonary functions of some asthmatic patients under certain forms of acute stress, such as when they endure heavy physical activity or suffer from a viral respiratory tract infection.

Given the safety and low cost of vitamin C, more research is needed on the possible effects of vitamin C on bronchial obstruction and airway hyperresponsiveness caused by exercise and the common cold.

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