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LETTER TO THE EDITOR

Therapeutic Potentiality of Coenzyme Q_{10} for COVID-19

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Dear Editor-in-Chief,

As coronavirus disease 2019 (COVID-19) death toll continues to surge around the globe, researchers are trying to reposition already-approved drugs for battling against sever acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Diet and nutritional status have long been acknowledged to be associated with certain diseases. Coenzyme Q_{10} (CoQ_{10}), also known as ubiquinone, is a fat-soluble, vitamin-like substance which plays a pivotal role in mitochondrial bioenergy transfer. Furthermore, it is an anti-oxidant with superb free radical-scavenging activities (1). Emerging evidence also hints that CoQ_{10} possesses immunomodulatory and anti-inflammatory properties. Regarding the latter, CoQ_{10} has been observed to inhibit expression of nuclear factor-κB, interleukin-6 (IL-6), and tumour necrosis factor-α (2). In light of the foregoing, CoQ_{10} has been assessed in numerous studies for its potential in treating various health conditions and maladies such as neurodegenerative disorders, cardiovascular diseases, cancers, periodontitis, diabetes, renal failure, and acquired immunodeficiency syndrome, to cite just a few (1).

There have been some attempts to assess potential associations between CoQ_{10} levels and symptom severity in patients who suffered from pulmonary infections (2-4). In a clinical trial, elderly hospitalized patients with community-acquired pneumonia who received oral CoQ_{10} (200 mg/d) as an adjunct to ceftriaxone plus azithromycin for 14 days exhibited improvement with defervescence and shorter length of hospital stay as compared to the placebo group (2). Likewise, another study revealed a significant correlation between serum levels of CoQ_{10} and chest radiographic findings of children with pneumonia caused by H1N1 influenza (3). The same authors also demonstrated that CoQ_{10} levels were remarkably lower in a pediatric population infected with H1N1 influenza in comparison to both controls and seasonal influenza patients (3). This finding was further substantiated by another investigation in which patients with acute influenza showed significantly lower levels of serum CoQ_{10} in comparison to healthy controls (P = 0.004), suggesting that diminished levels of CoQ_{10} may predispose individuals for acquiring viral respiratory diseases (4). Serum levels of CoQ_{10} in influenza patients were also inversely correlated with certain inflammatory markers (4).

Interestingly, one study has reported the beneficial effects of CoQ_{10} supplementation (100 mg/d for 4 weeks) in asthma patients, which was evident by a significant enhancement in forced expiratory volume in 1 s (FEV1)/forced vital capacity (FVC) ratio (5). Furthermore, different nanosuspensions of

CoQ_{10} for nebulization have been recently developed for pulmonary disorders (6), providing more effective drug medication delivery.

A recent study on rats revealed that CoQ_{10} protects sepsis-induced acute lung injury (7). Of note, the levels of high-mobility group box 1, IL-6, macrophage inflammatory protein 2, and keratinocyte chemoattractant were significantly diminished in CoQ_{10} group compared with the untreated controls ($P < 0.05$). Similarly, administration of CoQ_{10} was shown to ameliorate lung and liver fibrosis in rats through modulation of autophagy in methotrexate treated rats (8).

Patients suffered from COVID-19 have augmented levels of pro-inflammatory cytokines, increased risk of pneumonia, and acute respiratory distress syndrome. Owing to obvious anti-inflammatory and immunomodulatory properties of CoQ_{10}, we envisage that the nutrient has the potential for adjuvant therapy against SARS-CoV-2 infection. On the other hand, there will be remarkable fibrotic consequences following the infection in some patients (9). Anti-fibrotic properties of CoQ_{10} may have a preventive role against pulmonary fibrosis secondary to COVID-19. Future clinical trials should scrutinize the therapeutic benefits of CoQ_{10} (in an inhaled form or oral administration) in critically ill patients.

Conflict of interest

Authors declare no conflict of interest.

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