

Magnesium: The neglected cation in COVID-19?

Dear Editor,

There is a constant emphasis on identifying possible supportive therapies to ameliorate the morbidity and mortality associated with the enigmatic COVID-19 pandemic which continues to bewilder the medical fraternity at large.

In this context, Tang *et al.* recently proposed that a judicious magnesium supplementation can benefit the COVID-19 cohort like hypertensives, obstetrics, and those with cardiovascular morbidities and airway hyper-reactivity, given its anti-inflammatory, anti-oxidative, bronchial smooth-muscle

relaxative role (heralding the beneficial impact on lung and airway related pathologies), as supported by clinical and pre-clinical research.^[1]

As an extension of their proposition, the membrane stabilizing properties of magnesium can be particularly useful to an intensive care unit (ICU) physician in attenuating the risk of torsades de pointes with concomitant pro-arrhythmogenic therapies such as hydroxychloroquine and macrolides, etc. While the drug is also effective against the majority of the other arrhythmias described with an underlying severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, the attributes like analgesia-potential and seizure-threshold elevation can equally contribute to the welfare of ICU-admitted COVID-19 patients.^[2] In addition,

magnesium has been suggested to have a role in staging the innate and adaptive immune-responses instrumental in combating the viral infection.^[2]

Moreover, the COVID-19 subset described to be vulnerable to a severe form of disease, such as the elderly cardiac patients are peculiarly prone to magnesium deficiency given the dietary insufficiency alongside the commonplace diuretic therapy. While magnesium deficiency is understandably frequent in critically ill with co-existing electrolyte disturbances, the lack of account of magnesium homeostasis in studies depicting hypokalemia in substantial percentage of COVID-19 patients mandates elucidation.^[1]

This elucidation becomes all the more relevant in the context of an ongoing COVID-related systemic inflammatory process being potentially compounded by an accompanying magnesium deficiency.^[1] The description of a significant inverse-relationship between the dietary magnesium and the serum C-reactive protein (CRP) bears testimony to the aforementioned.^[3] Furthermore, a systematic review and meta-analysis by Simental-Mendia *et al.* revealed a reduction of CRP levels attributable to magnesium supplementation in diverse inflammatory settings.^[4] Remarkably, the depiction of an attenuated lipopolysaccharide-inflicted acute lung injury in mice treated with magnesium sulfate adds to the contextual significance amidst the pandemic.^[5]

Hypomagnesemia can be an important underemphasized factor that might propel the severity progression of COVID-19. Therefore, serum magnesium merits meticulous attention wherein subsequent closely monitored supplementation can be pivotal in assisting the management of high-risk SARS-CoV-2 patients. Nevertheless, while administering this versatile drug, caution needs to be exercised in critically ill patients with altered renal clearance and those on concomitant neuromuscular blockers.

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Conflicts of interest

There are no conflicts of interest.

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