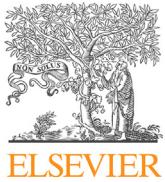




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Letter to the Editor

Hypocalcemia and hypoalbuminemia during COVID-19 infection: Opportunities for therapeutic intervention



Dear Editor,

We write about the article “*Prevalence and predictive value of hypocalcemia in severe COVID-19 patient*” [1] by Liu et al., published in the June 2020 issue of your journal. Here the authors noted a positive correlation between serum calcium and albumin, lymphocyte counts, and a negative correlation with IL-6 levels during COVID-19 infection. This letter provides a mechanism that (unlike vitamin D deficiency [2]), reproduces this spectrum, and discusses its therapeutic relevance.

Hypocalcemia [3], hypoalbuminemia [4], and the cytokine storm [5] including IL-6 elevation [4,6] can be induced by the unbound [4] unsaturated fatty acids [7] released during severe COVID-19 infection. This occurs due to adipose lipolysis (in agreement with obesity worsening COVID-19 [8]), and causes distributive shock, renal failure and arrhythmias via endothelial, epithelial and cardiomyocyte injury respectively [4]. These unbound fatty acids are elevated in respiratory failure [4], when fatty acid carriers and antagonists; i.e. albumin and calcium are depleted [4]. Calcium and albumin normally bind these fatty acids with favorable enthalpies of -20 KJ/mol [3] and -230 KJ/mol respectively [4], and prevent lipotoxicity [3]. Acute lipolysis of large adipose tissue amounts in obese patients can overwhelm the ability of calcium and albumin to bind these fatty acids, lower calcium and albumin, cause widespread mitochondrial injury [9], organ failure and death.

The therapeutic relevance in COVID-19 lies in early supplementation of calcium and albumin to maintain their normal levels before organ failure. Such supportive care may prevent severe COVID-19 infection later, since late supplementation after organ failure is pointless [10].

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Competing interests

None declared.

Ethical approval

Not required.

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