

Review Article

**Carnitine and its derivatives as a potential option for cardiovascular, neurologic, and metabolic complications of COVID-19**

---

As a multisystem disease, COVID-19 and its treatment demonstrate a wide variety of complications. Carnitine is a non-essential amino acid derivative that plays an essential role in the metabolism of fatty acids and alleviates inflammation and oxidative stress. A thorough literature search was performed using the keywords and their synonym words including COVID-19, SARS-CoV-2, SARS, MERS, Carnitine, and L-Carnitine. Non-English literature and conference abstracts were not included. Animal experiments were excluded unless supporting the basic evidence for carnitine efficacy. We investigated the possible role of carnitine and its derivatives in COVID-19-induced fatigue, cardiovascular, neurological, and reproductive system complications. Oxidative stress and Inflammatory factors are vital in cellular injury pathways caused by COVID-19. Carnitine and SARS-Cov-2 followed common cytokine and stress oxidative-related cellular pathways. Carnitine may act as a protective antioxidant against SARS-Cov-2 infection by modulating proinflammatory cytokines. Considering the safety profile of carnitine, it may have promising clinical results in alleviating COVID-19 severity and its complications.

**Keywords:** COVID-19, SARS-CoV-2, COVID-19 drug treatment, carnitine, cytokine, Oxidative stress

UNDER PEER REVIEW

UNDER PEER REVIEW

UNDER PEER REVIEW

UNDER PEER REVIEW

UNDER PEER REVIEW

#### **COMPETING INTERESTS DISCLAIMER:**

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

UNDER PEER REVIEW

UNDER PEER REVIEW

UNDER PEER REVIEW

UNDER PEER REVIEW

*PCOS: polycystic ovary syndrome*  
*LAC: L-acetyl carnitine*

UNDER PEER REVIEW