



Short Communication

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# Selenium: An Important and often Ignored Trace Element

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The global impact of the COVID-19 pandemic has shown quite clearly the inadequacy of many vitamins and minerals in our diet. As a result, it is imperative to reexamine the recommendations for these nutrients, as many of them have an important role to play in the immune system's ability to combat viruses such as COVID-19. For example, selenium status, was shown early on by Zhang et al. [1] to be one of the factors determining the outcome of COVID-19 cases in China. They found a significant association between the cure rates and the background selenium status. Selenium in the soil originates from the erosion of parent rocks, with some areas of China being very high in selenium while other parts having levels less than 0.1mg/kg soil [2]. Evidence connecting low selenium status with greater susceptibility to viral diseases was first discovered with the development of Keshan disease among the population of Heilongjiang Province [3]. Several studies conducted in the 1990s found that selenium-deficiency increased the virulence of RNA viruses such as coxsackievirus B3 and influenza A [4,5]. Selenium is known to regulate the immune response to inflammatory diseases by enhancing the production of antibodies, IgG and IgM, as well as the activity of NK cells [6]. Supplementation of patients suffering from HIV with a selenium-rich yeast increased the number of CD4+T cells which proved to be a factor in preventing the development of full-blown AIDS [7]. Viral infections generally increase the production of reactive oxygen species (ROS), which can be scavenged and inactivated by the

selenoenzyme, glutathione peroxidase (GPX 1), which is known to have antiviral properties [8]. The recent identification by Jin et al. [9] of M<sup>(pro)</sup>, a key protease enzyme in the coronavirus (COVID-19) responsible for viral replication, has become the primary target for therapeutic inhibition. Ebselen, a synthetic organoselenium drug identified by Sies [10] over 25 years ago as a mimic of GPX1, exhibited promising antiviral activity against M<sup>(pro)</sup>. A systematic review of the extensive publications on selenium and COVID-19 by Fakhrolmobasherhi et al. [11] showed that a deficiency in selenium was associated with the worst outcomes of COVID-19. They concluded that supplementation of COVID-19 patients with selenium was beneficial in preventing the progression of this disease.

## Acknowledgement

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## Conflict of Interest

None.

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