COVID-19: THE BENEFITS OF VITAMIN C – AN EVIDENCE-BASED INFORMATION LEAFLET

Vitamin C is important for immune functioning Vitamin C has important anti-inflammatory, immunomodulatory, antioxidant and antimicrobial properties and can help combat acute respiratory distress syndrome (ARDS) and sepsis, common in severe COVID-19. Vitamin C has 11 antiviral mechanisms and should be the first line of defence against any viral disease, including COVID-19. [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18]

How common is deficiency, especially in COVID patients? UK's National Diet and Nutrition Survey reports that 4% of 65+ year olds and 40% of those in care homes are deficient (blood levels <11nmol/l). Additionally in the UK, 25% of men and 16% of women in the low-income population are vitamin C deficient[19, 20], as is supported by other studies[21,22,23]. Deficiency is regularly noted in severe infection and sepsis[24]. Low vitamin C is commonly found in COVID-19 patients[25,26]; three small Spanish studies found that 82%-100% of patients with COVID-19 had low or undetectable vitamin C[27,28,29]. A Chinese study found that blood levels of vitamin C in COVID patients were 5-fold lower than that in healthy volunteers[30]. Many researchers believe that increasing intake could help prevent COVID-19[31,32,33,34].

How can I increase my intake of vitamin C? Fruits and vegetables can be high in vitamin C, particularly citrus fruit, kiwi fruit, berries, melons, other tropical fruits, peppers, broccoli and Brussels sprouts. However, fruits are also rich in sugar and you are unlikely to obtain the levels of vitamin C needed for COVID-19 protection. Supplements will usually be needed.

How much Vitamin C should I supplement? The body's requirement for vitamin C changes on a daily basis and is particularly high when infected or warding off infection. The normal measure of how much vitamin C is required is bowel tolerance – when the body has sufficient, it triggers loose stools or diarrhoea. Nutritionists usually recommended taking vitamin C to bowel tolerance for prevention, but as soon as signs of infection are observed, then take 1-2g every couple of hours until the symptoms have subsided. [35,36,37]

Could Vitamin C be an effective treatment for COVID-19
A meta-analysis showed that oral or intravenous vitamin C reduces the length of stay in intensive care and duration on mechanical ventilation in non-COVID patients[38]. Several clinical trials of intravenous vitamin C are now in progress, often in combination with other therapies, and some have completed.

In patients with severe COVID, intravenous high dose vitamin C decreased markers of inflammation and blood clotting, normalised immune function and ameliorated cardiac injury[39,40,41,42,43] and could also improve oxygenation[44,45]. COVID-19 patients who received intravenous vitamin C became symptom-free earlier and spent fewer days in the hospital compared to those who received standard therapy alone[46]. Similarly, a Chinese study showed that risk of death within 28 days was reduced for COVID patients with high-dose vitamin C[47].

Combination studies show that in COVID-19 patients, vitamin C with glycyrrhizic acid (from liquorice) proved effective in improving immune function and suppressing inflammation[48]. The US Frontline COVID-19 Critical Care Alliance (FLCCC), who give 3g of intravenous vitamin C every 6 hours for up to 7 days, have reported zero COVID-19 deaths in intensive care in those patients without end-stage co-morbidities[49,50,51].

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How common is deficiency, especially in COVID patients?

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