# VIRAL IMMUNE SUPPORT

Covid-19 is not only a respiratory disease but affects the whole body. There are serious concerns about long-term effects of post covid syndrome or "Long COVID". Remarkably, to date throughout the world 22 vaccines have been approved with another 134 in various trial phases.

To date, despite the impressive outcomes of vaccination, no "magic bullet" or cure has been identified to combat COVID-19. Recently a number of therapeutic agents have demonstrated significant promise for both prevention and treatment of this disease (Ivermectin, Vitamin D, Quercetin, Melatonin, Vitamin C and Corticosteroids). It is unlikely that any of these agents on their own will be effective against such a complex disease, but rather a combination of agents with different mechanisms, used in specific phases of the disease will be needed. In addition, evidence is emerging that many of these agents may act synergistically (1,2,3).

Vaccination is an essential and core part of the solution, however appears that it will take some time to achieve adequate vaccination levels that provide herd immunity, if that is indeed possible. Furthermore, mutant strains of SARS-CoV-2, such as Delta strain, have appeared and are demonstrating increased transmissibility (4,5). Many of these mutations involve spike protein, against which almost all vaccines have been targeted. This raises the real possibility that vaccines may become less effective against the mutating strains (6). In fact, here we are in late 2021 following the emergence of this more infectious Delta variant still experiencing lockdowns and disruption despite climbing vaccination levels. Under these circumstances, as is the practise in managing many other serious diseases, there needs to be focused multipronged strategy emphasising prevention and early treatment to help prevent patients progressing to the pulmonary phase and requiring hospitalisation. Professor Paul Marik (Professor of Medicine, Chief of Pulmonary and Critical Care Medicine - Eastern Virginia Medical School), feels strongly that such a focus is essential.



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He and his colleagues have implemented a protocol (I-MASK+) to mitigate development and progression of the disease, limit deaths and allow the economy to reopen (8) (Figure 1). This approach may help with concerns about the less serious but still contagious breakthrough infections and the components of the Eastern Virginia Medical School's I-MASK+ prophylaxis and early treatment protocol are outlined in Figure 2 (8). This protocol is continuously updated in response to emerging knowledge. An up-to-date protocol can be found at: https://covid19criticalcare.com/wp-content/uploads/2020/11/FLCCC-Alliance-I-MASKplus-Protocol-ENGLISH.pdf



Figure. 2 Adapted from MARIK, PAUL. 2020, EVMS COVID-19 Management Protocol.

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It is not the purpose of this article to promote use of Ivermectin or discuss protocols associated with its use. Rather the focus here is an evidence-based review of the antiviral or immune supporting properties for a range of nutrients as well as emerging re-purposed use of some supplements. This seems only logical in view of these nutrients already known pharmacological properties, side effects, and dosing regimens. This must be advantageous for rapid testing in clinical trials and COVID-19 treatment protocols.

## **B** Vitamins

(B1 – Thiamine, B2 – Riboflavin, B3 – Niacin, B5 – Pantothenic Acid, B6 – Pyridoxine & Pyridoxal-5-Phosphate, B9 – Folic Acid, B12 – Cobalamin).

The B Vitamin Group play an essential role in cell functioning, energy metabolism and immune function. They assist in proper activation of both the innate and adaptive immune responses, reduce pro-inflammatory cytokine levels, prevent hypercoagulability, and potentially reduce the length of stay in hospital (44, 45, 46, 47, 48). Therefore the assessment of Vitamin B supplementation could be useful as a pharmaceutical adjunct to current treatments (Figure 3, 44).

# Vitamin C

Anti-Inflammatory, antioxidant and immune enhancing properties including increased synthesis of Type I Interferons (9, 10, 11).

## Quercetin

Direct viricidal properties against a range of viruses including SARS-CoV-2. It is also a potent antioxidant and anti-inflammatory agent (12, 13, 14, 15, 16, 17, 18, 19, 20, 21). Quercetin acts as a Zinc ionophore (22) and it is likely that with Vitamin C has synergistic prophylactic benefits (2). Caution is advised in individuals with pre-existing thyroid disease as in-vitro studies have shown that Quercetin and other flavonoids can interfere with thyroid hormone synthesis and multiple stops in the synthesis pathway (23, 24, 25, 26). Quercetin should also be avoided in patients taking cyclosporin or tacrolimus (27), but if it is taken, close therapeutic drug monitoring is required.

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# Zinc

Elemental Zinc at doses of 30-50mg per day (28, 29, 30) inhibit RNA dependent polymerase (31, 32, 33, 34, 42, 43) in vitro against SARS-CoV-2 virus (31) and is essential for innate and adaptive immunity (32).

# Vitamin D3

Vitamin D insufficiency has been associated with an increased risk of death from SARS-CoV-2 (33, 34, 35, 36, 37, 38, 39, 40, 41). A recent study of residents in a long-term care facility demonstrated that those residents who took Vitamin D supplementation had a much lower risk of dying from COVID-19 (38).



#### Magnesium

Both in human and animal models, evidence is showing that magnesium plays a key role in the immune and anti-inflammatory response as a co-factor for immunoglobulin synthesis, C'3 convertase, immune cell adherance, anitbody-dependent cytolysis, IgM lymphocyte binding, macrophage response lymphokines and T-helper B cell adherance (60, 61, 62, 63, 64, 65).

## Melatonin

Melatonin, a very safe medication (49), has anti-inflammatory, antioxidant, immunomodulating and metabolic effects that may be important for mitigation of Covid-19 disease (50-57). Interestingly, bats, the natural reservoir of coronavirus, have naturally high levels of melatonin, which may protect them from developing symptoms (13).

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#### Viral Immune Support Formula (3 Capsules Per Dose - Taken once daily with food)

Ascorbic Acid (Vitamin C) - 1000mg Pyridoxine HCl (Vitamin B6) - 25mg Pyridoxal-5-Phosphate (Vitamin B6) - 10mg Zinc (as picolinate) - 15mg Zinc (as citrate) - 15mg Vitamin B12 (as cyanocobalamin)- 100mcg Niacin (Vitamin B3)- 20mg Quercetin - 250mg Vitamin D3 - 1000iu Magnesium (as glycinate) - 50mg Thiamine (Vitamin B1) - 50mg Riboflavin (as riboflavin-5-phosphate - Vitamin B2) - 5mg Calcium Pantothenate (Vitamin B5) - 100mg

30 days (90 caps)

Plus: Melatonin (3mg-10mg at bedtime)

Melatonin Sublingual Liquid 10mg/mL 30mL

#### OR

Melatonin Capsules - Immediate or Modified Release 30 doses

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