

The cost-effective options in combating COVID-19.

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Editorial Note

The first wave of COVID-19 rapidly spread worldwide during the first half of 2020 [1]. Since August 2020, the second wave of COVID-19 has been rampaging across most countries, coinciding with the initial winter period. A third wave may likely occur during the late spring of 2021. These peaks coincided with annual winter flu season in countries located in northern and the southern-most latitudes, during their respective winter periods. Recently identified COVID-19 mutant has rapidly spread into many countries in the world, faster than the original COVID-19. An acquisition of gene mutation in spike-protein, this mutant developed increased infectiousness but less lethal than the original virus [2,3].

What causes increase Vulnerability to COVID-19?

Several factors, such as advanced age and chronic comorbidities, increase the risk of acquiring COVID-19. Comorbidities include diabetes, hypertension, metabolic disorders, obesity, immune deficiency, and chronic pulmonary, cardiovascular, and renal diseases [4]. One or more of these conditions, especially in the elderly, in conjunction with hypovitaminosis D, significantly increases the vulnerability to COVID, developing complications, and death.

There are three biochemical commonalities among the above-mentioned chronic disorders that known to increase the risk of COVID. Hypovitaminosis D, low level of expression of ACE-2 receptors, and having a weak innate immune system. This combination can be deadly, increasing the susceptibility and complications, unless attended promptly and effectively.

Making the Population Vitamin D Sufficiency

COVID-19 patients, in addition to having vitamin D deficiency and low ACE-2 receptors (the latter aggravated by hypovitaminosis D), consistently have a high concentration of markers of inflammation [5,6] and oxidative stress [7,8], haul marks of COVID-19 infection. However, supplement or regular exposure to the sun

and vitamin D adequacy can subdue them [9,10]. The mentioned combination further increases the susceptibility to COVID-19, its complications, and deaths. Governments should prioritise, making available to the public, the right doses of vitamin D supplements at an affordable price or free of charge, and use the mass media to advice safe sun exposure. These would enable people, especially populations at high risk, to increase their innate immunity against COVID-19 rapidly.

Vitamin D deficiency is the most crucial and modifiable risk factor that can be corrected quickly, thus minimising the vulnerability of COVID-19. Recently published, over 160 clinical research studies on the use of vitamin D to minimise the risks of COVID-19, provided abundant evidence supporting the beneficial effects of high-dose vitamin D supplements in the prevention and treatment of COVID-19 [11,12]. Vitamin D is effective and inexpensive, and its risk is negligible. In contrast, cost and the risks from COVID-19 and adverse effects from antiviral drugs and vaccines are considerable. Moreover, the cost of vitamin D supplements is less than 1% of the median cost of antiviral medications or a vaccine.

Exaggerated reported Incidences and Deaths from COVID-19

Deaths and infections due to COVID-19 have markedly exaggerated by administrations, World Health Organisations, Big-Pharma, and the main-stream media. In some countries, such as the United States, certain European countries, Australia, health organisations, hospitals, and some physician groups are incentivised to do so, because of significant financial gains. The latter applies not only for taking care of persons with COVID but also when they die. Depending on the quality of PCR kits used, between 20 and 50% tests could have false positivity-even those who are PCT positive not necessarily have the infection.

Studies suggested that approximately, 40% of deaths as reported from COVID-19 are due to COVID-19. The remaining 60% of deaths reported as COVID may or may not be PCR positive, but the cause of deaths is not directly from COVID. For example, even people who died from other diseases, road traffic and other accidents, and

suicides have included COVID deaths. Therefore, once such false data removed from statistics, the prevalence and deaths from COVID-19 are not that different from a severe flu season.

Right Approach versus the Wrong in Handling COVID-19

Based on the above observations and global data, there is no reason to have total lockdown and curfew in any country to control COVID-19. Those governments that enforced such failed draconian restrictions invariably failed to control local epidemics. In most tropical countries, such as in South East Asia (except in India), the incidence and infection fatality rates are trivial, and there was no reason for curfews. The harm to the affected population, the economic collapse, and the excess deaths associated with a curfew is much higher than the COVID-19. What is necessary is local movement restrictions to and from the affected suburb or village to contain the disease for about ten days.

It is essential for allowing the development of natural immunity and encouraging sun exposure to boost and maintain the innate immunity in the population. Over 170 global experts working in this field have contributed to an open letter to world leaders to highlight vitamin D's awareness and importance in preventing and treating COVID-19 (<https://vdm-meta.com>). To propagate and sustain the COVID-19 virus, it needs the human host: this is facilitated by those with vitamin D deficiency, allowing them to get infected and develop symptomatic COVID-19 syndrome and spreading to others. Virtually all ICU admissions from COVID complication and deaths occur in those with severe vitamin D deficiency (i.e., 25(OH)D concentration, less than 12 ng/mL). Nevertheless, some argue that this is due to reverse causality [i.e., acute COVID-19 syndrome, reducing serum 25(OH)D concentration] but there is no evidence to support that. Recent data confirm significant benefits effects of vitamin D supplements in controlling COVID-19 [12-21].

Evidence of Efficacy-What needs now

Evidence produced from over 30 clinical observational studies reported recently, provided evidence of strong inverse correlations between serum 25(OH)D concentrations and having COVID-19, severity, and deaths [12-21], together with few RCTs [22]. Hill's criteria for causality in a biological system are mostly satisfied with vitamin D supplementation in reducing the risk of COVID-19.

The global researchers working to prevent COVID-19 are urging governments to make available, cost-effective therapies such as hydroxychloroquine, vitamin D, and ivermectin as a part of the routine strategy to prevent and treat COVID-19. These three agents should use strategically and proactively to prevent and treat COVID-19. To control the pandemic's negative impact, one needs to implement a

wide range of programs and strategic preventative actions rather than relying on standard public health guidance.

The currently used, mundane public health initiative to control epidemics for prevention of COVID-19 is unlikely to work, so as the lockdown and curfews. Based on emerging scientific data, different approaches are needed to control the pandemic, including enhancing population vitamin D status and broader use of hydroxychloroquine and ivermectin for prevention of COVID-19 in those exposed and PCR positive persons [23]. However, hydroxychloroquine should not use in higher doses than recommended nor initiates in persons with advanced symptomatic COVID [24]. While generic vitamin D should use in most persons, symptomatology can be rapidly controlled in exposed and PCR positive persons by using partially activated vitamin D, calcifediol (tablets of emulsion form) [16].

Conclusion

The three agents mentioned above are easy to transport, store, administer, and economical to use. Moreover, three agents have acceptable adverse effects and are well-tested over several decades. These agents are effective against COVID-19 and are already available in virtually all countries. Thus, respective governments should increase availability, approval without restrictions, enabling physicians to reduce disease burden rapidly, the need for ICU admissions, and reducing deaths.

Conflicts of Interest

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