

Evaluation of the Effects of Vitamin D Supplements on Mortality and Intubation Rates in Patients Involved with Covid-19

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Abstract

The aim of this study was to evaluate the effects of vitamin D supplements on mortality and intubation rates in patients with CVD19. Patients with coronary heart disease who take enough vitamin D have a 52 percent lower risk of dying than people with vitamin D deficiency, according to a new study. Research has shown that lowering vitamin D3 levels increases the risk of death in patients with severe dementia. Vitamin D is a hormone produced by the skin when exposed to sunlight. The point to be made is that there are differences of opinion in the world about the side effects of vitamin D deficiency, but what is certain. According to experiments conducted in our country, we are facing a severe deficiency of vitamin D among the people, especially among postmenopausal women, and according to the results of research, most Iranians are deficient in vitamin D. The best way to increase immunity is to use natural foods to get vitamins and minerals. In the corona pandemic, the role of vitamin D in boosting immunity, getting COVID-19, hospitalization and mortality has always been debated. Cross-sectional studies on the role of vitamin D in reducing the incidence, hospitalization and even death of Covid-19 in different countries show a significant relationship between serum vitamin D levels and the severity of COVID-19 and mortality from the disease. This association is probably due to the effects of vitamin D on the immune response to this infection. The results of cross-sectional studies show that countries such as Spain and Italy, which have the highest rates of vitamin D deficiency, have the highest rates of COVID morbidity and mortality. In contrast, northern European countries, which had higher serum levels of vitamin D due to food fortification, also reported lower rates.

Keywords: Vitamin D Supplements, Patient, Covid-19 Involved, Immune.

Introduction

We all know that vitamin D is an essential vitamin for maintaining healthy bones and teeth. But researchers have suggested other roles for the vitamin, the most important of which is to protect the immune system. Vitamin D supplements can play a role in preventing acute respiratory infections. But does the dose of vitamin D in Covid-19 play a role?

Research has been done on the link between vitamin D intake and the disease, and there are contradictions. Studies have been done on the vitamin D intake of people who have done the Covid-19 test [1-3]. A total of 4,314 individuals who performed the Covid-19 test were studied. A review of medical records revealed that vitamin D levels in 489 had been measured over the past year. In this group, 71 people tested positive, 32 of whom were deficient in vitamin D [4].

The research team also helped predict the number of people with low vitamin D levels when taking Covid-19, based on vitamin D test records and information from vitamin D supplements [5-7]. The study found that 21.6 percent were deficient in vitamins at the time of the test. However, research

shows that vitamin D may play a role in a positive Covid-19 test result [8]. The team reviewed data from the COVID test results of 19,1979 people, as well as their vitamin D levels over the past twelve months. The results showed that 8.1% of people with SARS-Cov-2 infection had adequate levels of vitamin D. However, 2.5% of people who were deficient in vitamin D tested positive (Figure 1). Research shows that 32.8% of 235 hospitalized patients had a vitamin D level below 30 ng/ml. There was also an association between good vitamin D levels and mild Covid-19. Although research has shown a protective role for vitamin D against Covid-19. However, few patients have been studied and other contributing factors [9-11].

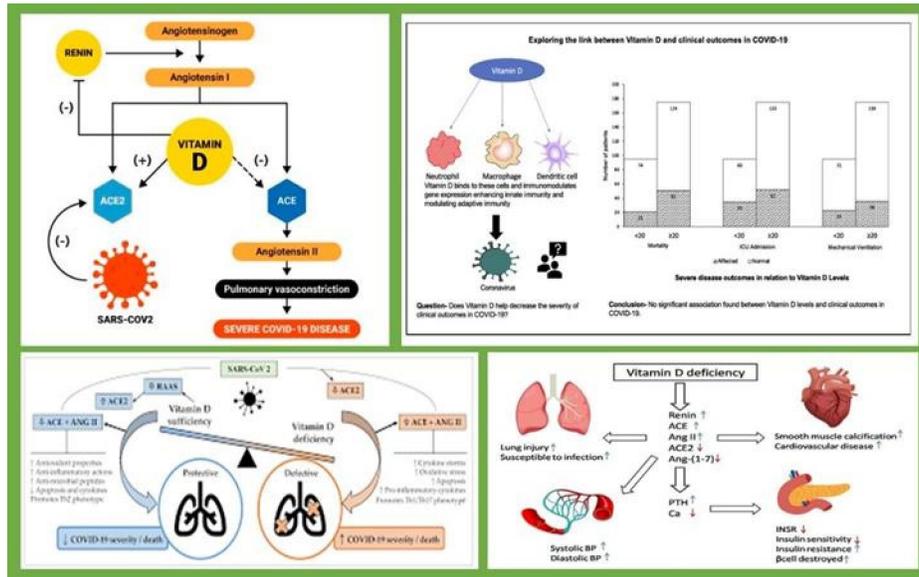


Figure 1. Evidence Regarding Vitamin D and Risk of COVID-19

Research shows that taking vitamin D supplements can help provide adequate amounts of this vitamin, while there is a link between taking vitamin D and Covid-19. Vitamin D has benefits for bone and muscle health. Taking it can reduce the risk of Covid-19 [12-14]. Many doctors believe that daily intake of vitamin D gives you the assurance that it is a tonkafeine, and this has been proven before Covid-19 [15].

Characteristics

All studies that included in present article were Retrospectives studies (Figure 2).

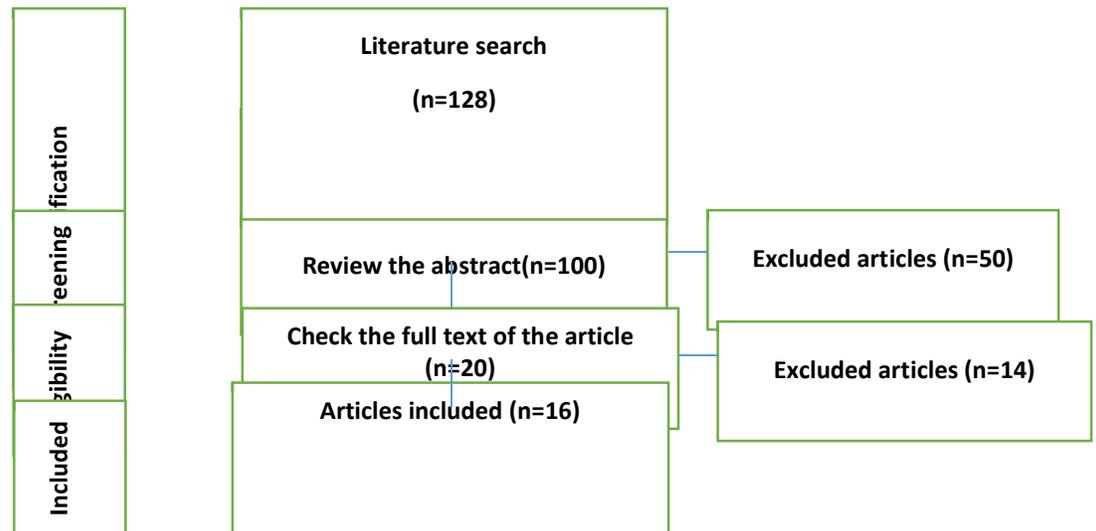


Figure 2. PRISMA flowcharts

The National Institutes of Health recommends that children under the age of one and adults over the age of seventy consume 15 micrograms of vitamin D daily. This amount is twenty micrograms for people over seventy-one years old [16-18]. Vitamin D plays an important role in various parts of the body, one of which is to strengthen the immune system. If the body has low levels of vitamin D, the body becomes more susceptible to infectious diseases, including the coronavirus [19-21]. Ways to get vitamin D include sunlight, food sources (fatty fish, fish liver oil and to a lesser extent chicken eggs) and vitamin D supplements [22-24]. Evidence shows that having enough vitamin D in the body improves the immune system and increases the ability to fight pathogens, including bacteria and viruses. Much is known about the new coronavirus, and the role of vitamin D in fighting the virus has not been proven. Vitamin D supplementation should be used with caution. Vitamin D is one of the vitamins that excessive intake (above 150 ng/ml) (Table 1) can lead to poisoning and dangerous side effects [25].

Table 1. Selected studies to analysis data related to study objectives

No.	Study. Years	Study design	Number of Patients		Age (mean) (years)
			male	female	
1	De-la-Rosa-Martinez et al., 2022	Retrospective	111	22	55
2	Tiobb et al., 2021	Retrospective	42	25	55.4
3	Sami et al., 2021	Prospective	142	441	54
4	Kim et al., 2020	Retrospective	11	123	45
5	Chew et al., 2020	Prospective	125	145	55
6	Liut et al., 2020	Retrospective	3	9	44
7	Safari et al., 2020	Retrospective	25	2	63
8	Wramp et al., 2020	Prospective	53	15	56.0
9	Covino et al., 2020	Prospective	65	11	80
10	Wang et al., 2020	Prospective	48	157	52
11	Qingchun et al., 2020	Prospective	11	10	79
12	Semen et al., 2020	Prospective	14	25	81
13	Tharakan et al., 2020	Prospective	203	236	66
14	Pasta et al., 2020	Retrospective	99	89	60

According to research conducted at Bar-Ilan University, people who suffer from vitamin D deficiency are more likely to have worsening symptoms of Covid-19 compared to people with normal and above normal levels of this vitamin [26]. In this study, vitamin D levels were measured in 1,176 patients from April 2020 to February 2021, after which vitamin D was found to help boost a person's immune system to fight the virus [27].

Thus, people with vitamin D levels less than 20ng/ml are more likely to develop severe Covid-19 than people with vitamin D levels above 40ng/ml [28]. Vitamin D is also a vital element in maintaining healthy bones, teeth and muscles, and its low levels are linked to infectious diseases, including cardiovascular disease [29]. Vitamin D deficiency also causes rickets in children and osteomalacia in adults. According to this study, the mortality rate was 2.3% among patients with adequate vitamin D and 6.25% among patients with vitamin D deficiency [30-32]. Amiel Dror of Bar-Ilan University: Maintaining normal levels of vitamin D during the Covid-19 pandemic is strongly recommended by local health authorities as well as global health organizations. The study found that vitamin D deficiency was a "risk factor" for the clinical course of the disease and mortality from Covid-19, but the researchers added that it was not yet clear why some people developed severe Covid-19 infection. They suffer while others do not experience a severe infection [33].

After studying global data on the new Corona or Covid-19 virus pandemic, scientists have found a strong link between severe vitamin D deficiency and corona mortality rates. The Northwestern University research team performed a statistical analysis of data collected from hospitals and clinics in China, France, Germany, Italy, Iran, South Korea, Spain, Switzerland, the United Kingdom and the United States [34]. The researchers found that patients' vitamin D levels were much lower in countries with high rates of Covid-19 mortality, such as Italy, Spain and the United Kingdom, than in patients in other countries with coronary heart disease [35]. Of course, this does not mean that everyone should start taking more vitamin D supplements, and this is a warning given by researchers.

The highest levels of vitamin D are found in northern Europe due to fish oil and vitamin D supplements and possibly avoiding less sunlight. The Scandinavian nations are among the countries with the lowest rates of Covid-19 and mortality rates, although it is important for everyone to know that vitamin D deficiency can play a role in Covid-19 mortality, according to the study. But not everyone needs to increase their vitamin D intake. The information available could shed light on the mechanism of coronary death, which, if confirmed, could introduce new therapeutic approaches to physicians and researchers [36].

When the research team noticed that there were strange differences between the mortality rates of Covid-19 in different countries, they set their goal based on measuring the level of vitamin D in patients [37]. Some experts have suggested that differences in medical care and treatment, age distribution in the population, type of tests or different types of coronavirus could explain this strange difference, but Northwestern University research team was skeptical [38]. The researchers believe that hypothesized factors do not appear to play a significant role in coronary mortality. The healthcare system in Northern Italy is one of the best in the world. There are differences in mortality rates even among the same age group [39]. Although the limitations in the experiments are practically varied, the differences in mortality rates are still significant; Even in countries where similar tests have been performed. However, the association of vitamin D levels in patients with coronary heart disease is significant. The highest levels of vitamin D are found in northern Europe due to the consumption of fish oil and vitamin D supplements and possibly less exposure to sunlight [40].

The Scandinavian nations are among the countries with the lowest rates of Covid-19 and mortality rates. Scientists have analyzed patient data from around the world and found a very strong link between vitamin D levels and cytokine storms. There is a highly inflammatory complication caused by an overactive immune system, and the association of vitamin D deficiency with coronary heart disease is significant [41]. Cytokine storms can severely damage the lungs, leading to acute respiratory distress syndrome and death in patients, and this appears to be the cause of most deaths in Covid-19 patients, not the destruction of the lungs by the virus itself. This means that the death of a coronary patient is due to the effects of a wrong immune system attack. This is exactly what led the research team to believe that vitamin D plays a very important role in saving or killing a coronary heart disease. Vitamin D not only strengthens our immune system, but also prevents over activity, which can be fatal.

That means having healthy levels of vitamin D in the body can protect a patient from developing the complex complications of Covid-19, including death, scientists say. These findings are so important that they may be able to halve the death rate from coronary heart disease. Having a healthy amount of vitamin D in the body alone cannot prevent people from getting Covid-19, but it can reduce the severity of the disease and greatly reduce the risk of death [42].

This connection can explain many of the mysteries associated with Covid-19, such as why children do not die of coronary heart disease. Children do not yet have a fully acquired and highly responsive acquired immune system, which is why they do not overact as a line of defense. Having a healthy amount of vitamin D in the body alone cannot prevent people from getting Covid-19, but it can reduce the severity of the disease and greatly reduce the risk of death [43].

Babies rely heavily on their internal immune systems, which can lead to a very low risk of coronary death in children. Researchers warn that people should not take high doses of vitamin D because of the risk of side effects. Further studies are needed to fully understand how and to what extent vitamin D should be taken in order to be most effective in protecting against the side effects of Covid-19. It is difficult to say which dose of vitamin D has the greatest effect in terms of Covid-19; But it is clear that vitamin D deficiency is very harmful, and by taking the right dose of this vitamin through supplements, this deficiency can be easily compensated, and this is another key to help protect people prone to Covid-19; For example, the elderly is more likely to be deficient in vitamin D.

The effect of various multivitamins in the fight against coronary heart disease

With the onset of the coronavirus epidemic around the world, attention has shifted to the role of supplements and vitamins in preventing and boosting the immune system against Covid-19 disease, according to ISNA. Researchers at the School of Health of Tehran University of Medical Sciences examined the available evidence to answer the question of whether taking a multivitamin or neurobion injection is recommended for weakness and complications after coronary artery treatment [44].

The effect of various vitamins in Covid-19 disease

Vitamin C: Vitamin C seems to be beneficial for patients with severe and critical illnesses. This vitamin has an anti-inflammatory effect and increases cellular immunity and vascular integrity. Studies have shown that vitamin C has beneficial effects in treating patients with pneumonia who experience severe Covid-19 disease. It is recommended

that these patients take vitamin C daily as a supplement or in the diet. But for a condition that is not severe, researchers have not found enough reason to take vitamin C [45].

Vitamin D: New findings confirm the effect of vitamin D supplements in helping the immune system fight Covid-19. This means that vitamin D strongly affects the response to infection.

Vitamin B12: Deficiency of this vitamin causes anemia, weakness, depression, mouth and tongue ulcers, mental disorders, memory loss, weight loss, gait disorders and bad breath. Patients with Covid-19 who have anemia and inflammatory bowel disease should take vitamin B12 by injection or orally, but due to the conditions due to overcrowding and possible population density in service centers, researchers recommend consuming the oral type. According to the Committee for Information and Public Education of Corona at Tehran University of Medical Sciences, which examines scientific documents, evidence and answers about the Corona virus; Recommended. People use multivitamins to boost the immune system to fight Covid-19. The important thing is that taking vitamins should be sensible. Because excessive consumption of some vitamins is associated with side effects. Consumption of fresh fruits and vegetables in the daily diet is recommended as a rich source of vitamins [46].

Effects of vitamin D3 on the body

Boosting immunity system

According to research, vitamin D3 plays a vital role in strengthening the immune system and thus reducing the mortality of Covid-19. Vitamin D3 stimulates the production of diphenhydramine and catalyst dine as endogenous antibiotics, which have not only microbial infections but also destructive effects on viral infections such as the flu. It is worth noting that the production of catalyst dine is dependent on the serum dose of 2 D OH (1a, 25) and a dose of 30 ng/ml is required for the production of catalyst dine, and doses above 40 ng/ml are also not effective. Research has also shown that adequate levels of vitamin D (Figure 3) can reduce side effects such as "cytokine storm" (high and rapid release of proteins in the blood) and eventual death from coronary artery disease.

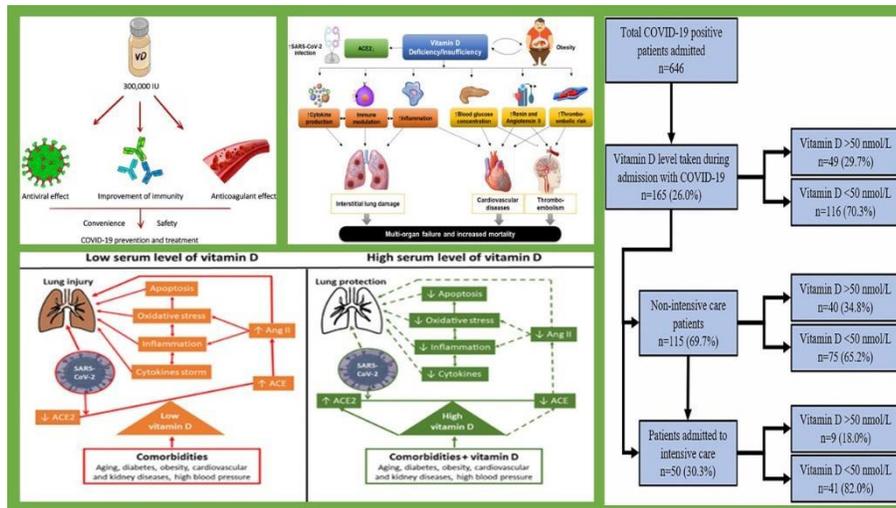


Figure 3. A Single Large Dose of Vitamin D Could be Used as a Means of Coronavir and Association of vitamin D status with COVID-19 and its severity

Bone Strength

Vitamin D is effective in strengthening bones by absorbing calcium and phosphorus from childhood to old age. It has been proven that by adding this vitamin in the diet of children and infants from rickets or osteoporosis, and in old age, by consuming it, bone fractures can be prevented [47].

Reduce Depression

Another side effect of vitamin D is an increase in depression, as many studies have shown that taking supplements and compensating for vitamin D deficiency is associated with a reduction in depressive symptoms. You may be

interested to know that depression itself is a factor in the weakening of the immune system, so vitamin D deficiency indirectly affects the immune system and increases the mortality of Covid-19 [48].

Miraculous Medicine to save critically ill coronary patients

A new study has found that a drug that is beneficial for heart patients reduces the risk of death and the severity of coronary heart disease. Scientists tested aspirin on critically ill coronary patients hospitalized and found that the drug could reduce the risk of coronary death by more than 40 percent. Experts at the University of Maryland School of Medicine say the findings support the use of aspirin to prevent severe coronary complications. People use aspirin as a blood thinner to reduce the risk of heart attack and stroke or to manage heart disease. Aspirin, used as an anti-inflammatory drug, has the ability to stop blood clots and is useful for diseases that increase blood concentration. The study looked at 412 Crohn's patients with a mean age of 55 years who had been hospitalized in Maryland in recent months due to the infection [49].

About a quarter of patients took low-dose aspirin daily before hospitalization or immediately after hospitalization to control their cardiovascular disease. The researchers found that aspirin use was associated with a 44% reduction in the risk of being placed under a ventilator, a 43% reduction in the risk of ICU admission, and a 47% reduction in the risk of death in the hospital compared with those who did not take aspirin. "These results need more research and should be used randomly," said Jonathan Chow, a university professor and anesthesiologist at Maryland Hospital [50].

Discussion

After reviewing numerous articles proving the protective effect of this vitamin against viruses, especially influenza and coronavirus, most studies have agreed that vitamin D deficiency can predispose to more severe cases. In pregnant women with vitamin D deficiency, an increased rate of bacterial vaginosis has been observed, which is a type of vaginal infection with an increased risk of miscarriage [51-53]. The role of this vitamin in regulating the immune system and thus modulating asthma and allergies in children and the relationship between its deficiency and debilitating diseases such as multiple sclerosis or MS, has been proven. Vitamin D deficiency in children can also lead to high blood pressure, and an article published in 2018 examined the relationship between low levels of this vitamin and stiffness in the walls of children's arteries. It should be noted that the rate of preeclampsia or pregnancy poisoning, which is a vascular disease in pregnant women, is almost established in women with vitamin D deficiency. Doctors also point to a link between vitamin D deficiency and a possible increase in gestational diabetes [54]. In the case of cancer and vitamin D, the majority of studies in the world have proven the protective effect of this substance as well as healthy nutrition against cancer and the direct relationship between compensating for its deficiency in patients with malignancy and increasing the chances of recovery.

Genetic and hereditary factors

Regulation of the level of this vitamin in the blood, the rate of oral absorption, synthesis, catabolism and its effectiveness, like other body reactions of organisms under genetic and epigenetic control. The amount of this important vitamin in the bloodstream is associated with the expression of countless genes such as CG, DHCR1, CYP2R1, VDR, CYP24A1. In our country, vitamin D deficiency and its complications are very common, especially in women and the elderly, and genetic differences and polymorphisms play a key and special role in it. Therefore, early detection of vitamin D deficiency, laboratory evaluations, genetics and polymorphisms can reduce the complications of vitamin D deficiency and provide tips for proper nutrition and lifestyle [55].

Given the vital role of this vitamin and the importance of its genetic regulation, it can be said that genetic testing in people who do not even show biological symptoms, especially in susceptible people, can be useful in terms of prevention and treatment [56-58].

Skin type

For example, darker skin has less ability to absorb sunlight, and since sun absorption is a major factor in the formation of vitamin D in the skin, so the amount of synthesis of this substance in them is less [59-61].

Sun protection agents

Especially with an SPF (sun protection factor) of at least 30, they can reduce the production of this vitamin by 95% or more. Infants who are exclusively breastfed. Especially if you have dark skin and lack of exposure to sunlight, you need to take vitamin D supplements. So, pregnancy increases the need for vitamin D [62].

Conclusion

One of the topics that has been proven to increase the body's resistance to coronary heart disease and is still being manipulated by experts is the use of vitamin D pills. Since the outbreak of the corona virus around the world, experts have begun testing to determine what causes the body to become more resistant to the deadly disease. However, until treatment and vaccines for Covid-19 are discovered, we need to take care of ourselves to strengthen the immune system so that if the virus enters the body, it will act as a simple cold and not be life-threatening. From the beginning of coronary heart disease, experts have stated that vitamin D will reduce coronary mortality. Do you know how this vitamin will increase the body's defenses? These days, with the increase in corona mortality, preventive measures and factors to reduce it have been studied more than before.

Vitamin D3 is one of the essential vitamins for the body and one of the fat-soluble vitamins, which helps the growth and strength of bones by controlling the balance and increasing the absorption of calcium, phosphorus and magnesium. Take vitamin D according to national instructions and be more careful and sensitive. If, according to national guidelines, you have been consuming 50,000 units of vitamin D per month for the past few months to prevent vitamin D deficiency, continue to do so. This recommendation is for children 2 to 12 years old with a dose of 50,000 units of vitamin D once every two months. Some studies have shown that people with severe COVID-19 and hospitalization have low serum levels of vitamin D (vitamin D deficiency). However, the risk factors for severe COVID-19 are the same as those for vitamin D deficiency, so it is difficult to tell if vitamin D deficiency is itself a risk factor for severe COVID-19. Risk factors include general health status, poor diet, and pre-existing conditions, such as diabetes, and liver and kidney disease. Vitamin D is important for the health of bones, teeth and muscles. This vitamin helps regulate blood sugar, heart and blood vessels, and lungs and airways. It is also involved in strengthening the immune system. These areas are also affected by COVID-19, so prescribing vitamin D to people with COVID-19 may help them recover faster or be less severe.

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