

## IMPACTS OF FOOD AND NUTRITION ON COVID-19 PATIENTS

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### Abstract

A pandemic occurring microscopic virus which is named 'novel coronavirus' causes respiratory illness and gastrointestinal infections spread by animals and winged creatures. By stopping the transmission of respiratory droplets (sniffles, cough), stopping bodily contact with the infected, taking and maintaining extortion about a few severe versatile rules have the ability to put an end in the expansion of this virus. Instead of consumption of foods carrying saturated fat or bad cholesterol, individuals should have a diet rich in minerals, beta-carotene, vitamins (C, D, and E) and zinc to improve the innate and adaptive immune system to fight against this virus. In purpose to decline the risk of this virus, natural growing color varieties vegetable consumption and reject the refrigerated fat consisting of food along meet with expire periods. As excessive intake of vitamin C cause excretory system failure, good and certain of it from cultivated (lemons, tomato, etc.) or artificial sources consumption can improve the immune system against this pandemic and different respiratory problem. Lacking Inhibiting or the presence of vitamin D is certainly a major characteristic in COVID-19 individuals, in taking vitamin D (oily fish, beef liver, etc.) could help resist from its own deficiency and another related malady. Avoiding foods from outside (such as fast foods, msg., beverages) and increasing the consumption of homemade natural food on daily basis will fill the portion against the risk of this global pandemic. In case of maintaining health service issues, provision of certain rules, inhibition of nutrient-rich constituents or particles, and maintaining social distance (6-feet separated) will stop the widespread of this pandemic. Declining the provoke of the global food crisis one should preside in maintaining the nutrition and nourishment across the globe, with extreme results for health and substance.

**Keywords:** Covid-19, Covid-19 patients, food ,nutrition

## Introduction

The World Health Organization (WHO) has pronounced the coronavirus illness 2019 (COVID-19) a widespread. [1] A worldwide facilitated exertion is required to halt the encourage spread of the infection. A widespread is characterized as “occurring over a wide geographic zone and influencing an uncommonly tall extent of the population”. [2] The final widespread detailed within the world was the H1N1 flu widespread in 2009. On 31 December 2019, a cluster of cases of pneumonia of obscure cause, within the city of Wuhan, Hubei area in China, was detailed to the World Health Organization. Already obscure modern infection was distinguished and named 2019 novel coronavirus in January 2020. This novel coronavirus was the reason of episode affirmed by the cases and examination of infection of 2019 novel crown infection [3][4]. In February 2020 WHO declared the title COVID-19 of novel coronavirus [5]. Corona viruses are a family of contaminations that cause sickness such as respiratory sicknesses or gastrointestinal infections. Respiratory illnesses can run from the common cold to more genuine illnesses eg.

1. Middle East Respiratory Disorder (MERS-CoV)
2. Severe Intense Respiratory Disorder (SARS-CoV) [6]

A novel coronavirus (nCoV) may be a present day strain that has not been recognized in individuals as of now. Once analysts choose absolutely what coronavirus it is, they give it a title (as inside the case of COVID-19, the infection causing it is SARS-CoV-2). Corona infections got their title from the way that they see underneath an amplifying instrument. The contamination comprises of a center of innate texture enveloped by an envelope with protein spikes.

## Pathophysiology of Corona Virus

Coronaviruses are encompassed viruses with a positive-sense single-stranded RNA genome and a helical symmetry. The genomic measure of coronaviruses ranges from around 16 to 31-kilo bases, exceptionally expansive for an RNA virus. The name coronavirus is inferred from the Greek (κορώνα, meaning crown) as the virus envelope shows up beneath electron microscopy (E.M.) to be delegated by a characteristic ring of little bulbous structures. This morphology is shaped by the viral

spike (S) peplomers, which are proteins that populate the surface of the virus and decide to have tropism. Coronaviruses are assembled within the arrange Nidovirales, named for the Latin (nidus, meaning nest) as all viruses in this arrangement to create a 3' co-terminal settled set of subgenomic mRNA amid disease. Proteins that contribute to the general structure of all coronaviruses are the spike (S), envelope (E), membrane (M), and nucleocapsid (N). In the specific case of SARS, a defined receptor-binding domain on S mediates the attachment of the virus to its cellular receptor, angiotensin-converting enzyme 2 (ACE2) [7]. Members of the group 2 coronaviruses also have a shorter spike-like protein called hemagglutinin esterase (HE) encoded in their genome, but for some reason, this protein is not always brought to expression (produced) in the cell [8].

## Transmission of Corona Virus

They are transmitted by mist concentrates of respiratory discharges, by the fecal-oral course, and by mechanical transmission. Most virus development happens in epithelial cells. In cold-type respiratory diseases, development shows up to be localized to the epithelium of the upper respiratory tract, but there's no satisfactory creature demonstrate for the human respiratory coronaviruses. Prove is still rising, but current data is showing that human-to-human transmission is happening. The routes of transmission of COVID-19 remain hazy at the show but prove from other coronaviruses and respiratory illnesses demonstrate that the infection may spread through expansive respiratory beads and coordinate or circuitous contact with contaminated discharges [9]. The hatching period of COVID-19 is right now caught on to be between 2 to 14 days [10].

## Food & Nutrition enhancement of immune system in COVID-19 patient

In the present time, the whole world is under lockdown due to the ongoing Covid-19 pandemic which started from a supermarket in Wuhan, China. The virus can cause infection or affect people of all ages from children to elderly no one seems to be safe from the danger of this virus. But still the virus can be more fatal or dangerous for a certain class of people such as people with underlying diseases

which weaken their immune system. As a vaccine or drug for fighting Covid-19 hasn't been discovered or manufactured recovery or prevention depends upon the safety measures or the capability of the immune system of one individual to fight against this virus. Stronger the immune system higher is the chance of the person for surviving the virus. So it is very important for us to take action for boosting our immune system.

Consumption of food high in saturated fat, sugars, and bad cholesterol can lead to various complications such as obesity, diabetes mellitus type 2, or various heart conditions. All these complications can make an individual's immune system weak. The weak immune system cannot properly fight against viruses like coronavirus or Covid-19. So we have to have a well-balanced diet to boost our immune system so that it can easily fight against the COVID-19 virus. Eating a high level of saturated fat, refined carbohydrates, and sugars are collectively called WD short for the Western diet. Consuming WD can induce our innate immune system which can cause damage to our adaptive immunity and also damage host defense ability against the virus. This can also lead to chronic inflammation which furthermore, has long term consequences like peripheral inflammation in those who recovers leading to more complications like dementia and neurodegenerative disorder. This can be caused because of the neuro-inflammatory mechanisms due to unhealthy food intake.

Obesity and type 2 diabetes are thought to be two prominent risk factors that can lead to increased severity of Covid-19. These conditions can be caused by consuming a high quantity or amount of saturated fat, cholesterol, refined carbohydrates and sugars, and consuming a low amount of fibrous foods, unsaturated fats, and food containing a high level of anti-oxidants.

Consuming foods that contain a high level of saturated fatty acids can cause chronic activation of the innate immune system which blocks the adaptive immune system. Consumption of an extensive amount of saturated fatty acids can cause a lipo-toxic state and activate the innate immune system by provoking the activation of toll-like receptor 4 which is found on macrophages, dendritic cells, and neutrophils. All these can lead to the activation of canonical inflammatory signaling

pathways that forms pro-inflammatory mediators and various other effectors of the innate immune system.

Consumption of high saturated fatty acids and fats can also affect innate immunity and blocks T and B lymphocyte function in the adaptive immune systems which can result from oxidative stress.

A healthy balanced diet can help to boost our immune system. An enhanced immune system can fight properly against the virus. Foods with vitamins, minerals, and antioxidants are proven to be effective in boosting the immune system. Vitamins like vitamin C and E, beta-carotene, and antioxidants can be found in various fruit and vegetables. These constituents have been proven to be effective boost one's immune systems.

- I. *Beta-Carotene*: It is considered as one the most powerful antioxidant. It works by decreasing inflammation and enhances or boosts the immune system by increasing the production of disease-fighting cells. Sweet potatoes, carrots, and green leafy vegetables are a great source of beta-carotene.
- II. *Vitamins C and E*: Vitamins C and E are the most common antioxidant found. They work by destroying free radicals formed by our bodies that can support and boost the body's immune systems. Red peppers, oranges, strawberries, lemons, etc are excellent sources of vitamin C. On the other hand, vitamin E can be found in nuts, seeds, spinach, and broccoli.
- III. *Vitamin D*: Though vast research and experiments it has been proven that vitamin D supplementation can reduce or prevent the risk of various viral infections, which includes respiratory tract infections caused by viruses. They basically work by inhibiting the formation or production of compounds known as pro-inflammatory compounds in the body. This leads to the enhancement of immune systems and helps fight against viruses like COVID-19. Fortified cereals and plant-based milk and supplements are a great source of vitamin D<sup>[11]</sup>.
- IV. *Zinc*: Minerals can also help in boosting our immune system for fighting against COVID-19. Zinc is a type of mineral that can improve

our immune system by increasing the production of white blood cells. White blood cell is a type of blood components which can defend against invader like viruses like COVID-19. Nuts, pumpkin seeds, sesame seeds, beans, and lentils contain a high level of Zinc.

### **Vitamin C supplementation against COVID-19 Patient**

This inconstancy shows the presence of components that impact the seriousness of the illness, one of which is our resistant framework.<sup>[12]</sup> Be that as it may, the think about shown that 200 mg or more of vitamin C supplementation every day was successful in moving forward the term and seriousness of the common cold.<sup>[12]</sup> A few audits pointed out that 100-200 mg of vitamin C demonstrated to be satisfactory to optimize cell and tissue levels for the lessening of persistent malady dangers.<sup>[12]</sup> In differentiate, the treatment of built-up contaminations requires altogether higher measurements of the vitamin to compensate for the expanded metabolic and fiery request. As a water-soluble vitamin, an abundance of vitamin C will be excreted within the urine. Hence, it ought to be famous that there's a chance of kidney stones in vitamin C supplementation, particularly with consumption of 1000 mg or more per day.<sup>[12]</sup> Indeed, in spite of the fact that there's still instability around the hazard and security dosage, those with a history of calcium-oxalate kidney stones, liver or kidney disarranges and gout ought to not devour over the top measurements of vitamin C. In the event that this cannot be done and supplementation is required, it is ideal to expend a combined supplementation of vitamins and other minerals, called different micronutrient supplementations.<sup>[12]</sup>

### **Vitamin D and Covid-19**

We still have generally small coordinate prove approximately the part of vitamin D in Covid-19. And whereas early investigate is curious, much of it may be circumstantial. For case, one little ponder from the Joined Together States and another consider from Asia found a solid relationship between moo vitamin D status and extreme contamination with Covid-19.<sup>[13]</sup> Thinks about evaluating ICU patients

have detailed tall rates of lack indeed sometime recently Covid-19. So we would anticipate seeing moderately tall rates of vitamin D lack in truly sick Covid-19 patients – whether vitamin D contains a part or not.<sup>[13]</sup> A few analysts have famous tall rates of Covid-19 diseases in ethnic minority bunches within the UK and US to recommend a part for vitamin D, as ethnic minority bunches tend to have lower levels of vitamin D.<sup>[13]</sup> Researchers have too recommended vitamin D plays a part by looking at the normal vitamin D levels of diverse nations near their Covid-19 diseases. But within the chain of command of logic prove these sorts of thinks about are weak.<sup>[13]</sup>

### **Risk factors for severe courses of COVID-19**

Over 60 years of age, a lessening within the synthesis of vitamin D within the skin gets to be clear, which assists increments in getting older<sup>[14]</sup>. The antecedent of vitamin D, 7-dehydrocholesterol within the skin decays almost 50% from age 20 to 80<sup>[15]</sup> and the rise of cholecalciferol levels in serum taking after UVB radiation of the skin appears more than a 4-fold distinction in people matured 62–80 yrs. compared with controls (20–30 yrs)<sup>[16]</sup>.

### **Impact of Nutrition and Diet on COVID-19 Infection and Implications for Kidney Health and Kidney Disease Management**

It is no amplification to say that since early 2020, the world has profoundly changed since of the widespread caused by the novel coronavirus, moreover known as COVID-19. Exceptional preventative measures counting social removing have dominated our day-to-day dynamics. A critical journey has followed to discover successful procedures against COVID-19 by utilizing conventional and novel pharmacotherapy and creating immunizations in case conceivable. Since COVID-19 infection attacks human cells through the angiotensin-converting enzyme 2 (ACE2) receptors, warmed dialogs proliferate as to whether earlier utilize of Expert inhibitors or angiotensin receptor blockers (ARB) can cause ACE2 receptor upregulation that would, in turn, lead to more regrettable COVID-19 contamination. In any case, it has to contend that, in the event that these same patients contract COVID-19 disease, their earlier ARB treatment ought to not be suspended since a coming about cytokine storm may lead to worse outcomes. Hence, incomprehensibly, indeed more-

wise ARB treatment may be advantageous amid the dynamic disease [17]. This is comparative to the weight catch 22 speculations that were commented around in a 2016 article in NATURE magazine [18]. It's like "that fellow who driven you to jail gets to be your companion in prison." The challenge is indeed more noteworthy in patients with diabetic and hypertensive kidney clutters or proteinuria patients since numerous of them have gotten Expert inhibitors or ARB specialists. There are blended information on wholesome and dietary approaches to anticipate the common cold, including by coronaviruses. Dr. Linus Pauling, the only person who ever won two unshared Nobel prizes, believed that higher admissions of ascorbic corrosive, too known as vitamin C, is a successful way to anticipate and treat the common cold. Regardless rising quackery on immune-boosting and enchantment nourishments to anticipate or cure Covid-19 contamination as a result of worldwide edginess and anxiety. In fact, we ought to keep in mind to eat great sums of fresh natural products and vegetables to guarantee the required supply of not only vitamin C but too other antioxidant vitamins [19] [20]. Are there dietary proposals to ensure people with CKD counting patients who are dialysis-dependent or have acute kidney injury (AKI) against the ravages of COVID-19? Information proposes that an earlier history of cardiovascular comorbidities counting hypertension is associated with a more extreme respiratory infection upon COVID-19 contamination [17] [21]. As to whether such CKD specific chance variables as protein-energy squandering (Seat) are linked to more awful COVID-19 results, this and other important questions stay to be tended to in upcoming epidemiologic thinks about of COVID-19-infected patients with kidney infections. Hill et al [22] conducted a 20-week, nonrandomized, single-center, pretest-posttest think about to examine the possibility of devouring an oat beta-glucan supplement for 12 weeks and evaluated its impacts on chosen uremic toxins in 28 patients with CKD. Their report showed that a diet supplemented with beta-glucan was secure and potentially efficacious in bringing down serum concentrations of trimethylamine N-oxide. Trimethylamine N-oxide is related to the intake of animal-based proteins counting ruddy meat and associated with more regrettable kidney and cardiovascular results [23].

Olvera-Soto et al [24] examined the impact of resistance work out in addition to dietary vitamin D3 (cholecalciferol) on nutritional status measures in 39 patients with CKD organize 4 not on dialysis and found made strides muscle work as measured by handgrip quality. At last, Martinez-Pineda et al [25] analyzed the impact of culinary medications on the reduction in potassium substance in potatoes and detailed that the potassium substance of potatoes is decreased to an acceptable limit utilizing these strategies.

Although the COVID-19 widespread is anticipated to continue to eclipse numerous perspectives of persistent care as well as instruction and inquire about in sustenance and kidney malady, JREN will proceed to cover both COVID-19 improvements and other vital needs in our field [26][27]

### Conclusion

The COVID-19 emergency undermines the nutriment security and nutrition of millions of individuals, numerous of whom were as of now enduring. A huge global food crisis is approaching. Within the longer term, we confront conceivable disturbances to the functioning of food frameworks, with extreme results for health and sustenance. With concerted activity, we cannot as it dodged a few of the most noticeably awful impacts but do so in a way that underpins a move to more maintainable nurture frameworks that are in better balance with nature which backs healthy diets and hence way better health prospects for all.

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