

# Diet Plan In Covid-19 To Boost Immunity

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## **ABSTRACT**

**Background:** *After outbreak turned pandemic of COVID-*

*19 struck the world, it has shaken every nook and corner of the world. Need of greater research and analysis on how we can contain this virus and prevent in first place. Summary: Various measures are being employed to contain the virus. The dietary factor plays a major role in influencing the outcome of the result. Certain substances which contain anti-viral properties needs more research to establish the relation between treatment and outcome after its usage. Infodemic so termed by WHO is also creating a global menace which can only be countered by true information. Conclusion: More comprehensive study is needed to prepare a diet plan well curated according to the present condition of patients after contraindications been evaluated to ensure most expected result.*

**Keywords:** *Pandemic, COVID -19, infodemic, global menace, diet plan*

## **INTRODUCTION**

The severe acute respiratory syndrome (SARS) has arrived with its new form SARS-COV2. It caused by novel coronavirus which is the latest entrant in coronavirus family. World Health Organization (WHO) named the disease caused by it as COVID-19. Coronavirus disease 2019 full form of the COVID-19 is named after crown shaped virus which was found such during research. More than 37 million people have been infected with top 3 infected countries namely united states of America, Brazil, Indian accounts for more than 50 percent cases. Death toll due to COVID-19 or case fatality crossed 01 million marks. Case fatality rate which is the ratio of number of deaths to number of cases is around 2 percent. (Data may vary as there is constant updating of information as according to situation change) Comorbidities are the single main factor deciding the severity of the virus effect.<sup>1</sup> Though various authorized agencies and governments are looking for solution but till now there isn't one. Various measures have been undertaken to contain the viral spread but the figure suggest the exponential and rapid pace of spread of the virus. Among certain factors diet is also a deciding factor whether a person will contract the infection or not or the severity of the above mentioned disease.<sup>2</sup> The huge case number requires huge infrastructure to accommodate the persons affected. But the health infrastructure is overwhelmed by the pandemic. Therefore efforts are being made to ensure that the person not get contracted the virus at first stage only.

There are various methods involving the preventive measure including non-pharmacological interventions

(NPI) like lockdowns, physical distancing etc. Dietary habits are also crucial in preventive measure. In USA the more obese and people having type 2 diabetes have greater chance of not only contracting the virus faster than others but also of need of high end care like intensive care and oxygen support. Proper diet will ensure from early stage that you are not affected by any kind of preventable viruses. For those who have comorbidities curated diet can be adoption along with the medical interventions. Some foods containing vital minerals, vitamins and nutrients should be adequately consume which is found to be strengthening the innate immune response. Along with virus the menace of Infodemic is also ongoing. People are being tricked in what is termed as quasi information. A proper counter campaign is necessary with NGO participation and governments to ensure that people get fact checked information.<sup>3</sup> Judicious use of diet is also a key factor in deciding the overall physical and mental state. In this paper we have taken stalk and birds eye view of the diet and its part in immunity boosting during COVID-19 pandemic.

### **NUTRITION IN DIET AND ITS CONNECTION TO COVID-19**

Novel coronavirus (Ncov2) is modified strain of coronavirus family. COVID-19 is caused by the novel coronavirus which was declared pandemic in mid-march by World Health Organization (WHO). Since then it is wildly spreading in every part of the world. It mainly affects the respiratory system which consists of lungs and other organs. It is found out that in many cases the underlying comorbidity is a factor in deciding the case fatality rate (CFR) among patients. Patients with diabetes, hypertension, renal failure, heart condition have more chance of showing the severe symptoms which is not shown in either cases. More than age it is this condition that will decide the course and outcome of the treatment. Even if old patients having healthy body the recovery rate is quite high. But in some cases even the patient's age is low and it has severe underlying condition then the complications arise need more complex treatment. Chances of increase in CFR are high in such cases. Dietary component is one of the key elements along with demography, geography, socioeconomic status which is highly neglected. Disease prevention is always better than disease treatment. But the prevention part is almost neglected, resulting in increased burden on already crumbling health care sector. The trend of diet containing high saturated fats, high amount of sugars is extremely bad in all the cases. This is also called western diet as it is popular and started among western countries. The high rate of obesity in these countries is attributable to this type of diet. Also low intake of fibers, unsaturated fats etc. is also contributing to the obesity and type 2 diabetes mellitus.<sup>4</sup>

Fatty acids of saturated products lead to inflammation and such high saturated fat diet inhibits the innate immune response, which is also a deciding factor in patients testing positive. Patients having these diets have high susceptibility of contracting the COVID-19. More importantly it hinders with cell activity and induces the oxidative stress resulting in the deterioration of the immunity power which actually fights with the virus. The T cell response in influenza like illnesses is found to be weakened in mice that were fed with the diet containing high saturated fat. T cell basically remembers the virus strain of the same family and develops the fighting response against the same. If this response is low then the hospitalization chances of the concern patients are increased. Otherwise mere primary care would have been sufficed. Intake of unhealthy diet in certain underprivileged group created high risk of widespread distribution of virus. It also found out that the patients with severe COVID-19 symptoms have low count of T cells. Also malnourishment is equally fatal as high food intake and can be very fatal if the virus is contracted by such persons or group as a whole.

Food is not only a medium or source to fulfill the urge aroused due to hunger it is a wholesome source to complete our nutrition quota which in turn is essential for maintaining the day-to-day function of the body.<sup>5</sup> This fact is almost neglected as the diversity in food and diet is often neglected. Monotonous diet is sometimes due to economic compulsions. Government run programs often serve only

coarse grains and cereals. This is insufficient in fulfilling the diverse diet criteria. Such diet in COVID-19 situation can be very fatal as necessary protection will not be ensured due to incomplete diet. Nutrition and health is deeply interconnected. One cannot ensure good health without nutrition. Diet also can be employed to manage the disease attack. More study is definitely needed to find out the relation between diet and recovery rate. Personalized nutritional plan according to the patient's overall condition along with pharmacological

Intervention will be helpful in not only severe patients but mild patients too. A proper plan with contraindications, comorbidity effects will help in precise and targeted treatment of the sufferer.

### **LIFESTYLE CHANGES AND EATING PATTERNS DURING LOCKDOWN**

The first outbreak turned pandemic started in Wuhan, Hubei province of China has forced various governments to take up non-pharmacological interventions like lockdown and physical distancing. It forced people to confine at home and movement restriction was imposed. This was necessary as there was no clear strategy for containment of COVID-19.<sup>6</sup> Almost all people except those who were providing essential services were made to stay at home. This has resulted in disrupting various biological cycles. As gymnasiums and physical activity areas were closed down for avoiding the large crowd to assemble and in turn to contain the spread, the physical activity level was drastically reduced. Sleep cycle disturbed due to inefficient physical activity inducing insomnia. These factors resulted in changing the food consumption pattern. Demand of junk food that is high in saturated fatty acids and sugars were consumed more. Midnight cravings which can result into type 2 diabetes were on rise. Eating cycle disrupted. Harmful contents were consumed. Intake of sin goods such as alcohol and cigarettes were

on increase after partial openings of concerned shops. Oxidative stress increased which can be dangerous as it weakens the immune system. No awareness about dietary patterns were made as all the resources were diverted to the containment of the spread of the novel coronavirus. Physical isolation also took toll on mental health as day to day faces were absent and there were huge amount of uncertainty over the course of the virus spread.<sup>2</sup> Unnecessary intake of food primarily junk food at irregular times attached with low physical activity can prove dangerous. This habit can bring more severe consequences in elderlies

with prevalence of diseases.<sup>7</sup> Small amount of people with high socioeconomic background were able to continue their daily routine. A proper campaign for proper and nutritional diet is the need of the hour to counter this bad habit. High toxic accumulation in the body is interesting factor to decide the real effect of lockdown like measures which can be checked after appropriate testing of the affected individuals. Body Mass Index (BMI) another interesting factor to check the obesity of a person. A trend of upward curve in obesity is seen.

Some co-morbidity like diabetes mellitus needs extra and regular care which is halted due to non-

pharmacological interventions (NPI). Diabetes mellitus in some cases have proved to be indicator of need of intensive care unit treatment to the patient concern. At home confined these patients are fighting two challenges. First one is difficulty in accessing health service and second one is to cope with anxiety induced over eating or under eating. In general there is also a trend of people eating less not because of health concern arising due to low physical activity but it is primarily due to anxiety induced phenomenon. Also due to lockdowns and physical distancing the regular supply of food was altered and people have to change their dietary pattern according to the available supply. This is not good particularly for diet restricted patients whose diet is curated by concerned physician or dietician as in the case of diabetes mellitus.

Diet also influences the gut microbial life which is also known as good bacteria which help in proper digestion of food. Recently there were studies conducted on feces in sludge and the trace of novel coronavirus was found. There is already established relation between gut bacterial health and respiratory illnesses.

Proper maintenance of gut bacteria will ensure the innate immune response in proportional quantity. The health of gut bacteria is very much influenced by the diet consumed by the individual. Proper curated diet plan according to individual will enhance the fighting capacity of the individual which is much needed in the time of COVID-19 pandemic and in general also. Gut microbial life is also found to be generating the anti and pro inflammatory responses according to the diet. Nutrition and gut microbial life has interlinked relation. High saturated fat and sugar diet has been found to disrupt the circadian rhythm. Whereas fiber intake is found to be a good source along with probiotics. Using proper and balanced diet as prophylactic or preventive measure will also lessen the burden on the health infrastructure.

## **MENACE OF INFODEMIC**

As the COVID-19 caused by the novel coronavirus is evolving a parallel INFODEMIC is also wreaking havoc along with the former one. The false information also known as Infodemic (as termed it by World Health Organization (WHO) which is a combination of information and pandemic) is circulating on social media platforms like wildfire.<sup>8</sup> As we are experiencing internet revolution exchange of information is becoming easy day by day. It can be used both ways as two way sword. Maliciously using and distorting the facts which can create another disaster can be best termed as false information. Certain types of dietary recommendations on the basis of false testimony of cured patients from COVID-19. The false message contain information that can deceive normal person who has a layman's knowledge. It is hard to separate real part from fake one as they are curated such that one needs expertise in such knowledge. One message about Ph values of different foods which can cure the disease. Generally extreme facts are put forward which is hard to resist. In message the ph value were exceeding limit of 14 which is hardly known by people. Even the mention of ph value of coronavirus was also mentioned. This creates artificial demand of substances mentioned which are marketed as they have no side effects. But the contraindications are not mentioned which can result into medical complications. Due to lack of proper information dissemination program folks have to rely on mouth to word sources or more exhaustively on internet. Various herbs known to be cure the COVID-19 disease which is the byproduct of quackery. Rural area is most affected but urban folks also are not out of the race.<sup>3</sup> They also get trapped in seemingly true information. Dietary patterns have drastically affected as one fears not to contract the COVID-19 thereupon relying upon unauthorized sources. People having comorbidity are on verge of collapse due these messages as their contraindication information is there.

## **SUPPLEMENTARY FOODS IN DIET THAT CAN BOOST IMMUNITY**

There are genuine supplementary dietary components which are really helpful in boosting our immunity. These supplement are backed proper study conducted on them and list of benefits, contraindications, doses, time are found. This can be helpful self-medication that can lessen the burden on already ailing health sector and can address the manpower deficit. These include vitamin c, vitamin d<sup>9</sup>, zinc etc which are proven to be anti viral and anti bacterial properties.<sup>2</sup> Vitamin c foods like citrus fruits lemon, amla have immense amount of vitamin c which can reduce the oxidative stress due to its anti-oxidants properties. Although Vitamin c should not be used as management tool of COVID-19. It is more of a preventive care than curative care. Proper study needs to be done to ensure the effectiveness with empirical study. Vitamin d is widely present in many food substances and also good amount of sunlight exposure in early period of daytime can stimulate the production. Sunlight is said to be mood enhancer which can cure mild sadness and can fill you with joy. Vitamin d also found to be inducing anti-inflammatory properties and boosting innate immune response by T cells.<sup>10</sup> Vitamin d food supplements include various types of fishes includes salmon, sardines, cod liver oil, canned tuna, egg yolks, mushrooms,

cow's milk, soymilk, orange juice etc. Though a proper study is needed to establish a concrete relation among these foods and its usage. Zinc is another supplement that is cherished as a treatment option.

Effects on suffering patient is underreported and needs more research but as our body demands minerals to function effectively in day to day life and to ward off the virus zinc can be consumed in safer quantity.

Food supplements containing zinc are meat, legumes, nuts, dairy, egg etc. The amount of zinc should be consumed daily stands at around 9-10 mg per day. Maintaining these minimum levels can easily keep us fit and healthy along with some physical exercises.<sup>11,12</sup> Few of the related studies were reported by Gaidhane et al <sup>13</sup>, Lohi et al <sup>14</sup>, Pande et al <sup>15</sup>. The evidences of Nutritional deficiencies and impact on health is reflected from Global Burden of disease studies <sup>16-21</sup>.

## CONCLUSION

It seen that diet is the single most important thing that we can control and manage. Proper management of diet can be very helpful. Almost every disease emerges from food or food related mismanagement.

Immune system is crucial aspect in building the immune system toward off the infection and prevent the body from any disease. Further in persons having undergoing some treatment or medical interventions such as of COVID-

19, study need to establish the relation between patient's health status and diet. Usage of vitamin c, vitamin d, zinc which are full of anti-oxidants and substances that stimulates and strengthen innate immune response should be studied more. More research is needed to be done in ensuring the more judicious use of diet as managing tool. Using it as a preventive tool is also a good way in ensuring the disease free life. Infodemic menace can be tackled from higher level to lower level with the help of various agencies and non-governmental organization. Proper dissemination of information from authenticated sources is must to do. After all health is wealth where everyone can have a life experience free from all illnesses. Of course more comprehensive research and analysis is needed. Diet as a force multiplier will prove not only in lowering the infection numbers but also give some relief for health infrastructure which is severely crunched.

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