

AN OVERVIEW OF BALANCED DIET ON COVID-19

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Abstract

Covid19 is a respiratory disease which was declared as pandemic by world health organization (WHO). It was affected from animal to humans and now all humans are in self-isolation to prevent the spread of viral infection. Vulnerable groups especially children, women and old people are at risk of getting affected by respiratory infections. During quarantine due to self-isolation and less exposure to outside world might lead to consuming high rate of diets which are high in saturated fats, simple sugars, refined carbohydrates which might lead to metabolic disorders like obesity which can complicate other health issue like hypertension, cardiovascular disease, diabetes increasing the risk of covid19 pathology and mortality. Optimal nutrition and dietary nutrient intake impact the immune system and helps in strengthening the immune system. A proper diet can ensure that the body is in proper state to defeat the viruses. Nutrition plays a key role in health which most importantly when taken as balanced diet with adequate requirement of complex carbohydrate like whole grains, protein rich legumes and meats, vitamin and mineral rich fresh fruit and vegetable which have all antioxidants, known as protective foods helps in boosting the immune system and increase the potential response to viral vaccine preventing the infections of respiratory tract during self-isolation and quarantine lockdown.

Keywords: *COVID-19, Respiratory infections, Vitamin-D, CRP, Vulnerable groups, Balanced diet, Immune system.*

Introduction

Covid-19, a viral disease which is caused by a novel corona virus, has become a global threat for humans which has turned into a pandemic. According to WHO, pandemic is defined as the “world wide spread of new disease”. The corona virus is one of the major pathogens which mainly targets the respiratory system [1]. Reports suggested that the onset of a possible corona virus outbreak called SARS-COV2, which is causing the disease covid-19. WHO has declared that the present epidemic as global public health emergency[2]. The psychological and behavioral countermeasures of the individuals and the community have been the vital determinants which helps to improve the pliability and also enhance the effectiveness of the public health approaching the pandemic which are magnitude similar to covid-19 [3]. The nutritional status of the individual has been the indicates against destabilization. Inadequate nutrition leads to health effects. A poor diet quality has its effect on not only on physical health but also on mental health. Therefore, optimal nutrition is a resource that helps the persons, community for global influence [4].

Effect of Pandemic on Vulnerable groups

Covid-19 is a highly communicable disease which continues to ravage the condition of world health and economy [5]. The impact of covid-19 is underscoring the limited progress which was made against non-communicable diseases. The people who are strikingly vulnerable who suffer serious illness to death due to covid-19 are mostly children and adult with comorbidities particularly non-communicable disease like hypertension, diabetes, obesity, undernutrition etc [6]. Covid-19 preventive measures like home quarantines, self-isolation and community lock down leads to risk factors leading to less physical activity, improper diets [7]. During global pandemic, the effects of nutrition could be underestimated as there is potential effect on maternal nutrition, micronutrient deficiencies along with intrauterine growth along with impact on maternal and child health programs which can lead to linear growth and childhood stunting [8].

Effect of Nutrition on Vulnerable groups

The covid-19 pandemic is considered as the perfect storm for global malnutrition. It will destroy the nutritional status of all vulnerable groups with different mechanisms, it is expected to have a dangerous decline in dietary quality in low income and middle-income countries which leads to the losses in income which are related to government shutdown which are mandated and also leads to deglobalization. Malnutrition increases due to failures in healthcare as the systems are strained to revert the resources from a range of nutritionally important functions which includes antenatal care, immunization, micronutrient supplementation and also in prevention and treatment of vulnerable death conditions for combating covid19 which might lead to acute malnutrition [9].

Key Actions to protect vulnerable groups

The researchers are operating and those working on malnutrition are working tremendously to prevent the nutrition crises the key actions include

- Keep agri-foods systems functioning
- To increase access to nutrition rich food and improve food quality
- To demand nutrient rich foods
- To improve dietary quality through social safety net program
- To invest in WASH program
- To support community-based management of acute malnutrition
- To protect Vulnerable (women, children, and old people)
- To have food and nutrition surveillance systems. [9]

Role of Vitamin D on COVID 19

It has been shown that vitamin D reduce the risk of infection through multiple mechanisms and helps in reducing the viral replication rates and concentration of several proinflammatory cytokines which leads to inflammation of lungs.[10] From the onset of pandemic, there is a growing number of observational investigations on patients around the globe have consistently recognized with the low vitamin D status which was prevalent in covid19 cases [11] Many countries have provided consistent data which is indicating that serum 25OHD levels < 30ng/ml, which is strongly associated to the risk of death in covid19.[12]

Role of CRP

CRP is suggested as valuable biomarkers to recognize the covid19 disease progression in non-severe adult cases. Elevated CRP levels are observed in the patients before the disease progression[13]. In covid19 patients it has been shown that the vitamin D suppresses the CRP and the cytokines storm. CRP is also known as the strongest marker for Vitamin D deficiency [14]. Studies suggest that vitamin D plays an important role as steroid hormone which acts as the immune system modulator which acts by down-regulating expression of inflammatory cytokines, which it enhances the macrophage function [15].

Role of Magnesium

Vitamin D metabolism is dependent on magnesium as cofactor such as

- Finding the Vitamin D to Vitamin D binding protein
- 25(OH) D synthesis
- 1,25(OH) synthesis
- 25-hydroxylase synthesis

Vitamin D receptor(VDR) activation for cellular effects magnesium deficiency leads to the decrease in parathyroid hormone synthesis and reaction and also the available VDR in target cells[16-18].Therefore, magnesium deficiency leads to vitamin D deficiency and significant supplementation of both can be significant for protective factor against clinical determination after adjusting to age gender and comorbidities[19].

Nutrient requirements for balanced diet during COVID-19

- **Energy Requirements-** Based on the body weight which is adapted by the personal nutritional states, physical activity of the person along with the chemical states and comorbidities, the daily requirement of energy was 27-30 Kcal/day
- **Protein requirements-** To fight the infection in the body and to help improve immune system, to prevent the weight loss and reduce the risk of complications. The daily requirement of protein is >1 g/ kg/day (up to 1.5 g/ kg/body weight).
- **Carbohydrate and Lipid Requirements-** The carbohydrate and lipid requirements should be met from non protein sources. The CHO/ Lipid ratio should range as 70:30 for persons without respiratory insufficiency and 50:50 with respiratory insufficiency foods with low GI has to take.
- **Water Requirements-** The persons should be adequately hydrated so as to not risk the electrolyte imbalances. Therefore, with adequate hydration we can prevent or treat the health issues like vomiting, diarrhea etc.
- **Vitamins and Amino acids-** Adequate vitamins, essential and branched amino acids should be taken. Sometimes probiotics must be considered to keep our gut microflora healthy and helps us in process digestion and absorption. Oral nutritional supplements are useful during malnutrition or under nutrition to stay healthy[20].

Nutritional recommendations

The current world is going through a pandemic of corona virus. In late 2019, it was started in wuhan, hubei and china. It was first named originally as 2019 nCov but later it was renamed as Covid19 by world Health Organization during February 2020.

The infection was started as epidemic which began as infection from animal to human. Which leads to direct cause of death due to severe atypical pneumonia.

The WHO has declared covid as pandemic and people from all the countries are under quarantine to reduce the spread of virus.

During quarantine it has been associated with greater energy intake along with higher consumption of carbohydrates, fats, and proteins [21]. During quarantine it has become stressful to constantly know the details about the pandemic continuously staying at home is pushing people to consume more comfort foods lead by food craving[22].

Which is leading to multiple health issues. Which include emotional, behavioral, cognitive and physiological process [23].

Foods help in reducing the effect of COVID-19

In the quarantine period it has been noted that due to high macronutrient consumption, there is a heavy possibility of micronutrient deficiencies which is similar as in obesity, which is mostly associated with immunity impairment along with impairment in cell-mediated immunity, phagocyte function, cytokine production, antibody affinity and the complement system making it more susceptible to viral infection[24].

The craving of carbohydrate helps in serotonin production. Which has a soothing and positive effect on mood. Studies showed that food rich in carbohydrate can have self-medicating properties reducing stress. Taking the high glycemic index foods to reduce stress may sometimes leads to developing obesity which can lead to chronic state of inflammation complicating with different complications like diabetes, hypertension, heart disease which can increase the risk of covid19[25].

Therefore, it is important to consume food which promotes the serotonin and melatonin. The variety of foods from different plant species which includes green leaves, fruits, nuts like almonds, cherries etc. contain serotonin and melatonin. They also contain tryptophan. Which plays as a precursor of serotonin.

Protein foods like milk and milk products have the amino acids tryptophan which act as sleep inducing factor and also tryptophan helps in regulation of satiety and calorie intake through serotonin that helps in lowering the carbohydrate and fat intake [26]. The yogurt which is a milk product has the killer cell activity which reduces the risk of respiratory tract infection[27].

It is important to follow the nutritional and healthy eating habits with a balanced diet which contain high amounts of minerals, vitamins and antioxidants. Studies showed that diet with fruits and vegetables supply the required micronutrients which help in boosting the immune system as they contain important nutrients like

vitamin E, vitamin C, vitamin A and antioxidants. Antioxidants help in increase of lymphocytes and T-cells helping in the potential increase in viral vaccine response [28].

Vitamin A is abundantly found in roots and green leafy vegetables while vitamin C is mostly present in bell peppers, citrus fruits, and mangoes, vitamin E is present in vegetable oils like wheat germ, sunflower, corn, nuts etc [29-31]. Vitamin D is associated with sunexposure which is reduced due to the quarantine which can lead to lower levels of 7-dehydrocholesterol in the skin. Presence of adequate vitamin D in the body helps in decreasing the risk of many metabolic disorders which might increase the higher risk of respiratory tract infections which might lead to death [32]. Vitamin D helps the respiratory tract and prevents infection. Therefore, vitamin D has to be met with diet, present in butter, fish, liver, egg yolk and milk products [33]. Another important element which helps in boosting the immune system is zinc. Zinc is mostly present in foods like poultry, red meat, nuts, pumpkin and sesame seeds, beans and lentils [34].

Conclusion

Diet pattern followed in healthy and balanced diet helps in preventing respiratory tract infections during quarantine period. The key food sources which should be included in diet during self-isolation are olive oil, protein rich legumes and meat products along with milk product products, vitamins and minerals rich fresh fruits and vegetables, vitamins rich whole grains with moderate amounts. Nutrition becomes a major priority during the lockdown period which helps in keeping away the infections mostly the respiratory tract infections. Always keeping the good source of foods in stock which helps in immune- supportive nutrients, planning proper meal portions and always having positive attitudes which help in keeping the mood swings in soothing manner and inturn help in removing all the negative health effect on the health during the Quarantine.

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