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EFFICACY OF THERAPEUTIC NUTRITION IN MANAGEMENT OF HAEMODIALYSIS PATIENTS DURING SARS COVID-19 PANDEMIC

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ABSTRACT

COVID-19 is a contagious disease caused by SARS (Severe Acute Respiratory Syndrome). It mainly affects lungs but it can also affect multiple organs such as kidney, heart, digestive system, nervous system, etc.

Infection has been reported in all ages and all vulnerable group.

All vulnerable groups and patients with co-morbidities like diabetes mellitus, hypertension, and cardiovascular disease are susceptible to covid-19 infection.

Covid-19 infection presents a special threat to patients on dialysis. Patients on haemodialysis has lymphopenia, lower serum levels of inflammatory cytokines, and milder clinical disease than other covid-19 patients. Patients with uremia are particularly vulnerable to infection and may exhibit greater variation in clinical symptoms.

Kidney involvement seems to be frequent in this infection and it is an independent predictor of mortality**.** Management of patients on dialysis who have been suspected to have been in contact with COVID-19 should be carried out according to nutritional management is important. Patients on haemodialysis and with covid-19 should provide adequate amount of antioxidants with high protein diet and limited fluids to prevent from covid-19 and maintenance of haemodialysis.

Keywords: efficacy, therapeutic, nutrition, haemodialysis, pandemic.

INTRODUCTION

Previous year, on March 11,2020 the World Health Organizations (WHO) declared coronavirus disease 2019 (COVID-19) a Pandemic.

The first case of COVID-19 was reported in WUHAN, a city in the Hubei of China.

Novel coronavirus disease (COVID-19) is a newly discovered disease which is very contagious and caused Severe Acute Respiratory Syndrome (SARS).

COVID-19 is an acute respiratory illness with pneumonia, which further effect multiple organs such as kidney, heart, digestive tract, blood and Nervous System (1).

In past years, SARS COV and Middle East Respiratory Syndrome (MERS) have infected more than 10,000 people in past 2 decades, with mortality rates of 10% and 37% respectively (2,3).

Virus of corona consists RNA due to which it is mutating very fast and according to WHO, in India there are total 4 strains of corona which is more infectious then before.

Chronic Kidney Disease (CKD) patients are associated with a more severe form of COVID-19(4-8). It is severe medical condition with a high prevalence of comorbidities, including Diabetes Mellitus, hypertension and heart diseases. The patients which are kidney patients and are mostly on Haemodialysis (HD) are older adults. They are likely to more susceptible to Severe Acute Respiratory Syndrome (SARS COV-2) than the normal general population.

Patients with end-stage renal disease (ESRD) are particularly susceptible to infection by COVID-19, as they combine several risk factors, such as old age, a less efficient immune system due to uremic status, cardiovascular disease .

Dietary interventions or modifications including therapeutic nutrition improve health outcomes, quality life and health conditions of CKD patients. Self-management through dietary modifications is helpful in reducing symptoms and progression of Chronic Kidney Disease (CKD) (9).

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Haemodialysis (HD) is highly during COVID-19 pandemic as it requires patients to travel to a dialysis centre at least two to three times a week to perform treatment for 4 hours. (10). Previously, Dialysis centres are not following the policies of social distancing and preventive measures. (11) but now they are doing proper sanitization of patients and monitoring patients health.

PROCEDURES FOR TREATMENT OF CKD PATIENTS AND HAEMODIALYSIS PATIENTS

Management of CKD patients

1. All patients of CKD with confirmed COVID-19 should be quarantined.
2. Early admission to Intensive Care Unit (ICU) in good or reputed hospitals is recommended for CKD patients.
3. Complete bed rest, oxygenation, maintenance of blood pressure, nutritional and fluid support for all CKD COVID-19 patients should be done.

Management of Haemodialysis patients

COVID-19 infection presents challenges for Haemodialysis patients in Dialysis centre as it increases the risk of transmission of infection.

1.Patients and accompanying persons should be given motion-activated hand sanitizer while entering the dialysis room.

2.Patients should wear medical masks and avoid meals during dialysis.

3.They can bring convenience food such as candy to prevent hypoglycemia.

4.Patients with suspected or confirmed COVID-19 infection should be admitted to a negative-pressure isolation ward of specified hospitals.

5.All patients who have fever should be screened for novel coronavirus infection and should be given dialysis in the last shift of the day until infection is excluded.

6.Dialysis shift and personnel: do not change dialysis shifts and caregiver staff to avoid cross-contamination and infection. Minimize the relevant contacts.

7.Place of dialysis treatment: patients should continue HD at the original HD centre and not change to another centre.

Recommended dietary management of haemodialysis patients in SARS COVID-19 pandemic

COVID-19 infection presents a special threat to patients on Haemodialysis. The mortality rate is high in haemodialysis (HD) patients with COVID-19 patients. This study has been done in China. A total 7 patients on haemodialysis died, of whom 6 has COVID-19 infection. (12).

The risk of contracting the infection is high under inadequate sleep, psychosocial or physical stress, inadequate nutrition that comprises the body's immune system.

Dr. Linus Pauling, the only person who had ever won two unshared Nobel Prizes, believed that higher intake of ascorbic acid, also known as Vitamin C, is an effective way to prevent and treat the common cold. Fava beans contain chemical compounds similar to quinine-based antimalarial medications, some of which are being used in COVID-19-infected persons, such as hydroxychloroquine. (13) Persons with favism should avoid fava beans, given the risk of haemolytic anaemia. CKD-specific risk factors as protein-energy wasting (PEW) are linked to worse COVID-19 outcomes. We encourage adequate protein and calorie intake, be it enterally or parenterally, so that any occurrence of hypokalemia or hypophosphatemia can be avoided, and that PEW, sarcopenia, and cachexia can be prevented or immediately corrected.(14) The nutritional assessment and the early nutritional care management of COVID-19 patients must be integrated into the overall therapeutic strategy, as with any critical illness and rehabilitation program.

COVID-19 patients should be considered for malnutrition. Nutritional assessment using Subjective Global Assessment (SGA) tool should be done of COVID-19 CKD Patients. Physical activity should be promoted to preserve muscle mass and function.

DIETARY GUIDELINES SHOULD BE TAKEN BY HAEMODIALYSIS PATIENTS IN COVID-19

1.Higher intake of ascorbic acid, also known as Vitamin C, is an effective way to prevent and treat the common cold.

2.Fava beans contain chemical compounds similar to quinine-based antimalarial medications, some of which are being used in COVID-19-infected persons.

3.Patients with CKD should consume minimally processed natural or whole foods such as fruits, vegetables, rice, lean meats, and home-cooked meals (instead of buying foods from a restaurant or processed foods from the market)

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4.On the other hand, most of the processed foods with excess amounts of sodium, such as sausages and cold cuts, and excess sugar, such as cakes, cookies, candy, and sugar-sweetened beverages, should NOT be consumed.
5.Milk and other dairy products, legumes (e.g., beans), and high-fat meats should be limited in the diet according to the diet prescription. (15)
Intake of foods high in potassium (K) should be monitored in patients with high serum potassium levels.
6.These vegetables should be washed, peeled, and diced and put in a pan with water to cook. After the boil for 15 minutes and throw away the cooking water, consuming only the cooked vegetable.
7.It is important to remember that a low-protein diet (0.55-0.60 g dietary protein/kg ideal body weight/day) (16) and a plant-dominant low-protein diet with more than50% plant-based sources are recommended for non-dialysis patients with CKD; these diets may have beneficial effects for CKD patients. (17)
8.For chronic dialysis patients, the recommendation is a dietary protein intake of 1.0 to1.2 g/kg body weight per day, and for all CKD stages, the recommendation for energy intake is 25 to 35 kcal/kg body weight/day.
9.Studies have shown that turmeric (curcumin), and nuts, and can improve the immune system: Turmeric: this spice can be added (approximately1.5 g/day) in stews and juices. (18). Brazil nuts: 1 nut per day. (19)

Role Of Vitamins In Haemodialysis In Covid-19 Pandemic

Efficacy of vitamin C supplementation in preventing the common cold or due to reduce its duration and severity and support respiration defense mechanism (20) has shown in haemodialysis patients. Natural foods rich in vitamin C such as oranges, lemon, grapefruit, lime ,tomatoes, kiwi, papaya ,etc. But if the person is diabetic he/she should avoid sweet fruits whose glycemic index is above 50.
Vitamin D is a modified steroid, necessary for metabolism of calcium and phosphorus. The existing evidence indicates that vitamin D improves immune function. Some studies show that the use of Vitamin supplements during COVID-19 pandemic is beneficial. Vitamin D has an essential role in developing immune system functions, but there is no strong evidence. Although, Vitamin C has numerous beneficial effects on the immune system.

Role Of Zinc In Haemodialysis In Covid-19 Pandemic

The human body has around 2 mg.of zinc in it. Zinc plays an important role in synthesis of a stabilization of DNA,RNA and Proteins. Natural sources of zinc are meat,fish,nuts,legumes,eggs,etc. Zinc deficiency has effect on bone marrow which reduces the precursors of immune cells (21).Zinc is an essential micronutrient that develop antiviral and antibacterial immunity.

Healthy Gut Microbiota

Studies have also emphasized that healthy gut microbiota is essential to mitigate inflammation and improve the immune system's function. It is also known that patients with CKD, older adults, and respiratory viral infections present dysbiosis. A high fibre plant-based diet should be recommended, given their favourable effect on the microbiome (20) and gut transit time that may improve constipation.(21,22)

PRECAUTIONS TAKEN BY HAEMODIALYSIS PATIENTS IN THIS COVID-19 PANDEMIC

1. The driver must be adequately guided by a health team about hygiene care including wearing a facial mask or covering.
2. Vehicle windows should remain open, when possible.
3. The patient must wear a mask or face covering at all times.
4. In the vehicle, patients should have access to a 70% alcohol gel for hand hygiene.
5. At the clinic, the patient must replace the used mask or face covering with a new one.

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CONCLUSION

This scoping review provides a summary of articles relating to COVID-19 pandemic and maintenance of haemodialysis patients by providing them therapeutic nutrition to build their immunity strong so that they can fight against corona virus. The majority of articles were perspectives and focusing on recommendations of nutrition and medication with End Stage Renal Disease (ESRD) patients on haemodialysis.

This review underscore the need for extensive sharing of information. The management of patients on dialysis must be carried with proper knowledge of sanitization, isolation, screening, protecting and maintaining good nutritional therapy. Immune system is highly dependent on vitamins and minerals. Its deficiencies have high impact on immune system.

The study shows that effects of nutritional interventions on COVID-19 treatments in CKD patients is in early phase. It is important to remember that micronutrient deficiencies lead to an impaired or weak immune system.

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COMPETING INTEREST

All author confirms that there was no conflict of Interest.

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