

# A Case Report on the Outcomes of Medical Nutrition Therapy in Pre and Post Cardiac Transplant

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## ABSTRACT

Cardiovascular diseases contribute to about 28.1% of total deaths in India. A 26 year old male presented with breathlessness, vomiting on and off, orthopnea and bilateral pitting pedal oedema. The patient was a known case of premature Coronary Artery Disease. The dietary assessment was elicited and noted that the patient was regularly consuming energy dense non-nutritive foods as major meals. Due to exacerbation of symptoms, the patient was posted for cardiac transplant. Nutrition care process was designed and the nutritional well being of the patient was managed pre and post cardiac transplant. The patient was monitored and evaluated post discharge and the improvements were reported.

**Keywords:** Cardiovascular diseases, Obesity, Non nutritive foods, Cardiac transplant

## INTRODUCTION

In 2016, Prevalent cases of cardiovascular diseases has dramatically increased in India from 25.7 million in 1990 to 54.5 million. The prevalence of cardiovascular diseases was highest in Punjab, Tamil Nadu and Kerala. In India, Cardiovascular diseases contributed to 28.1% of total deaths and 14.1% of total DALY. <sup>[1]</sup> The epidemiological evolution in India for the past 2 decades has increased enormously; in a short time frame, the predominant epidemiological characteristics have leaped from infectious diseases,

diseases of undernutrition, and maternal and childhood diseases to non-communicable diseases (NCDs). <sup>[2]</sup>

This case report aims to discuss the Medical Nutrition Therapy in pre and post cardiac Transplant patients. As nutritional status is a potentially modifiable risk factor, the development of strategies designed to optimize nutritional status shows a decline in the short term risks in post transplant period. <sup>[3]</sup>

## CASE PRESENTATION

A 26 year old male, AC mechanic who is a chronic smoker (5 no /day) for past 6 years and alcoholic, consuming 350ml of alcoholic beverage containing 60% alcohol for the past 4 years with a present BMI of 34.3kg/m<sup>2</sup> (Class 3 obesity, Asian cut off points) and a strong family history of cardiovascular diseases presented to the hospital with complaints of breathlessness, vomiting on and off, pitting pedal oedema in the extremities and orthopnea. He also had reported of pricking pain in chest at the time of admission. The patient was not a known case of Diabetes mellitus, hypertension, epilepsy but a known case of gastric ulcer. Upon further investigations, it was noted that the patient was diagnosed with premature recurrent Coronary Artery Disease (CAD) three years ago, Anterior Wall Myocardial Infarction (AWMI) in 2016 and Interior Wall Infarction (IWMI) in 2017. At the time of presentation, the blood

analysis reported dyslipidemia and elevated liver enzymes. In 2018, the patient was icteric with loss of appetite, fluid overload, anasarca, anuria, breathlessness, diarrhoea and diagnosed with CAD with an EF: 25% and Jaundice, was discharged after conservative management. Due to further exacerbation of the symptoms and with a declining EF, the only treatment option was cardiac transplantation.

The nutritional history of the patient was elicited which revealed that, the patient was 179 cm in height and 52 kgs weight 5 years ago, after which he had gained about double the usual body weight and stood at 110kg on the weighing scale with a BMI of 34.3kg/m<sup>2</sup> and a waist circumference of 36 inches. Additionally it was also found that, the patient had skipped breakfast every day for the past 5 years with an on and off consumption of lunch, which when consumed mainly included a large carbohydrate meal accompanied with non vegetarian source of protein loaded with cholesterol and saturated and trans fats .It was noted that he did not consume dietary fibre in any form as part of the major meal or in between the meals. To compensate for the skipped breakfast and sometimes lunch the patient had an increased intake of sugar sweetened hot beverage during the day. He consumes around 2100 kcal, 27 gms protein, 123gm of fat and 234 gm carbohydrates for dinner meal alone whereas rest the day his calorie is less than 20% of his total calorie intake consume during dinner(which would mainly include refined cereal prepared with edible hydrogenated fat and saturated fat accompaniment being . The consumption of fibre and poly phenol rich edibles (fruits and vegetables) was less than a serving per week. The patient was found to walk lesser than ten minutes every day.

During the hospital stay, the patient was given an adequate calorie, normal protein and moderate fat diet consisting of 1900kcal, 70gm protein, 235 gm carbohydrates and 55gm fat along with a serving of glycaemic friendly formula. In order to prevent cardiac cachexia, the diet

was designed to meet the initial post op nutritional requirements (25kcal/kg, 1gm protein, 25% fat and 60% carbohydrates, 24gm fibre and adequate fluids) of the patient to preserve the muscle mass and prevent refeeding syndrome. Excess energy intake during the pre transplant period increases the secretion of catecholamine and insulin plasma concentrations causing physiological stress. An increase in insulin levels induces renal sodium and water re-absorption and may decompensate cardiac failure. [4]

After 5 months of hospital stay, the patient had undergone cardiac transplant on 16<sup>th</sup> June, 2019. The patient was kept on nil per oral for 12 hours after which he was extubated and started on clear liquids. During this period the patient was very fatigued and anorexic therefore the initial intake was very poor. On POD 5 the patient was started on a semi solid diet along with a serving of glycaemic friendly formula, the intake of the patient was gradually improved and on POD 7 the patient was switched to a customised normal diet.

On POD 7 it was also noted that the blood urea (65mg/dl) and the total bilirubin (5.3 mg/dl) was high. In retrospective studies it was seen that post-transplant haemolytic uremic syndrome characterized by micro angiopathic hemolysis, thrombocytopenia, and renal failure is an not very common but a potentially serious complication in organ transplant recipients, it is reported that <1% of the cardiac transplant receipts present with uraemia and hyperbilirubinemia. [5] Therefore the diet was designed to be with adequate calories, high protein (mainly high biological value sources), moderate fat, fibre and fluid based on output and obligatory losses. Since low biological value protein is shown to increase the blood urea it was included in restricted amounts. Uremia improved and reduced to 35 mg/dl on POD 9. It was also reported that the patient had lost around 25 kg during the entire hospital stay, and the progression to a healthier BMI 26 kg/m<sup>2</sup> when compared to the previous on admission BMI

34.3kg/m<sup>2</sup>

The patient was discharged on 6<sup>th</sup> July 2019, on discharge the patient was advised the following:

- To achieve and maintain ideal body weight To limit on simple and refined carbohydrates
- To step up complex carbohydrates in the diet
- To decrease the total intake of saturated fats and trans fats and prefer healthier sources of fat
- To restrict sodium rich foods
- To consume only home cooked foods
- To exercise for at least 150 minutes a week and to achieve a step count of 8000 steps per day. [6]

The patient was evaluated and monitored over telephone calls every two days initially and once a week after that till further review at the Nutrition OPD.

During the post discharge follow up it was noticed that the patient had lost around 5 kg in 2 months with a weight of 80kg. It was also noted that the patient has achieved a step count of 9000 everyday which was tracked using the pedometer. The dietary assessment revealed that the patient was following the adequate calorie, high protein, fat restricted, high complex carbohydrate, sodium restricted and adequate fluids diet which was advised on discharge. The patient was found to be more positive, enthusiastic and conscious about the importance of physical activity and healthy diet

The patient was again readmitted on 16<sup>th</sup> of October with complains of low grade fever, headache and body-ache and was tested positive for MRSA .Therefore, he was started on infection specific antibiotic therapy for a period of 5 days and discharged.



## DISCUSSION

The primary goals of solid organ transplantation are to prolong survival, enhance quality of life and rebound patients to a state of well-being. Nutrition plays a pivotal role during the pre and post transplant period. Pre transplant, healthy eating and being at an ideal weight may help to recover faster from surgery. After transplant, the caloric and the protein requirements are increased due to stress and catabolism as a result of the surgery, so effective medical nutrition therapy plays an

important role in maintaining homeostasis. Nutritional parameters have been shown to positively correlate with outcome after transplantation. During the, often long, preoperative waiting period, there is time to replete patients nutritionally. [7] Being cachectic or obese preoperatively is associated with decreased postoperative survival in all heart transplant recipients. Additionally, being obese preoperatively is also associated with increased infection post heart transplant. [8] Patients who undergo organ transplantation receive

immunosuppressive drugs in the post transplant period. All of these drugs influence host metabolic response or alter nutrient intake. One of the most prominent aspects of the post transplant period is the occurrence of dyslipidemia, which may require dietary or pharmacologic control. Dietary recommendations for this patient population include limiting carbohydrate intake, restricting caloric intake to maintain ideal body weight, and maintaining a low cholesterol/saturated fat diet. [9] Lastly, physical activity should be emphasized as it is shown to optimize physical functioning following transplant and may reduce or attenuate the side effects of immune-suppressors [10] and to prevent further onset of secondary diabetes and cardio vascular disease.

## CONCLUSION

Timely nutritional assessment and intervention may improve the outcomes surrounding the post transplantation period. Finally, due to the globalization of the food industry, increased awareness on mindful and conscious eating should be emphasized for the younger generation both in the urban and the rural sector to prevent any metabolic disorders in the future.

## Abbreviations

DALY -Disability adjusted life year; EF - Ejection Fraction; CAD - Coronary Artery Disease; MRSA- Methicillin- resistant Staphylococcus aureus

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