

Nutritional Rehabilitation for Tuberculosis

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ABSTRACT

Tuberculosis (TB) is caused by a bacteria known as Mycobacterium tuberculosis which most often affect the lungs. Tuberculosis (TB) was one of the top 10 causes of death worldwide in 2017, and was responsible for more deaths than Human immune deficiency virus(HIV).In 2017, 1.6 million people died from TB, including 0.3 million among people with HIV. Tuberculosis (TB) is a contagious disease related to poverty, under nutrition and poor immune function. TB morbidity and mortality are highest in low-and middle income countries. Hence, tuberculosis patients have poor nutritional status resulting in anorexia, cachexia and generalized weakness. Adequate consumption of calories, proteins, macro and micro nutrients during tuberculosis recovery support the immune system and the biochemical reactions involved in the repair and restoration of cells and tissues. Nutrition support plays vital role to improve treatment outcomes in tuberculosis patients and promote their health in all the aspects.

Key words: Tuberculosis (TB), Mycobacterium tuberculosis, Nutritional rehabilitation.

INTRODUCTION

Tuberculosis (TB) is caused by a bacteria known as Mycobacterium tuberculosis which most often affect the lungs. TB was curable and preventable. About one-third of the world's population had latent TB, which means people have been infected by TB bacteria but are not (yet) ill with the disease and cannot transmit the disease. People infected with TB bacteria have a 10% lifetime risk of falling ill with TB. When a person develops active TB disease, the symptoms (cough, fever, night sweats, weight loss etc.) may be mild for many months. This can lead to delays in seeking care, and results in transmission of the bacteria to others. People with active TB can infect 10-15 other peoples through close contact over the course of a year.

Tuberculosis (TB) was one of the top 10 causes of death worldwide in 2017, and was responsible for more deaths than Human immune deficiency virus(HIV).In 2017, 1.6 million people died from TB, including 0.3 million among people with HIV. Globally in 2017, an estimated 558 000 people developed TB that was resistant to rifampicin (RR-TB), the most effective first-line drug, and of these, 82% had multidrug-resistant TB (MDR-TB).The World health organization (WHO)End TB Strategy serves as a blueprint for countries to reduce TB incidence by 80% and TB deaths by 90%, and to eliminate catastrophic costs for TB-affected households by 2030. Ending the TB epidemic is also a Sustainable Development Goal target. Protecting and promoting human rights, ethics, and equity is a key

principle of the End TB Strategy. 10 million people fell ill with TB in 2017, including 0.9 million among people living with HIV. Tuberculosis (TB) is a contagious disease related to poverty, under nutrition and poor immune function. TB morbidity and mortality are highest in low-and middle income countries

IMPACT OF TUBERCULOSIS ON NUTRITIONAL STATUS;

The nutritional status and the intake and utilization of foodstuff are profoundly altered during the body's response to infection. Infection is accompanied by a complex variety of nutritional and metabolic responses within the body. Patients usually have loss of appetite and body weight. Muscle wasting, anemia, loss of lean and fat mass. Hence, tuberculosis patients have poor nutritional status resulting in anorexia, cachexia and generalized weakness.

Infection increases the expenditure of energy and degrees of tissue break down in the body thereby increasing energy needs in the tuberculosis patients. Increase breakdown of protein causes muscle wasting. High losses of protein also result in mal-absorption due to diarrhea, loss of fluids, electrolytes and other nutritional reserves. The breakdown of protein and other reserves due to fever also aggravate malnutrition and further impair resistance against the infection. The response to infection also has reflecting impact on the micronutrient status which play vital roles in many different metabolic processes. So, tuberculosis patients usually have poor nutritional status resulting in anorexia, cachexia and generalized weakness.

Nutritional Requirements:

Nutritional requirements of TB patients vary with their age, gender and activity levels. Factors affecting food intake such as food availability, appetite, eating patterns, medication side effects, traditional food taboos, life styles, psychological factors and economic factors should also be considered during meal plan.

- **Dietary principles**

High calorie diet, High protein diet, High vitamins and minerals and High fluid soft diet.

- **Energy Requirements** for hyper catabolic and undernourished patients are approximately 35-40 kcal per kilogram of ideal body weight. The average requirement of energy for a sedentary adult is estimated to be 39 kcal/kg for male and 35 kcal for female. It will vary between the patients depending on the severity of wasting and undernutrition.
- **Protein requirements** as 10-15% of the total energy intake. An intake of 1.2-1.5g of protein per kilogram body weight is recommended. High biological value proteins of animal origin like milk, eggs, fish and meat have relatively higher proportion of essential amino-acids.
- **Fat requirements** as 15-30% of total daily energy intake should be provided by fats. Oils, nuts, milk, cheese, butter, ghee, meat are fat rich sources.
- **Micronutrient deficiency** especially iron and folate, Vitamin A, Zinc, Vitamin D are common in TB patients. These micronutrient deficiencies are essential as they can impair the cell mediated immune responses. The recommended daily allowances of vitamins, minerals shall be obtained if the patient has a diet adequate in quantity and quality with recommended intakes of the basic food groups-cereals and pulses, vegetables and fruits, milk or egg or meat; oils, fat, nuts.
- Due to poor appetite, a good multivitamin and mineral supplement providing 50% and above is needed for TB patients to meet their requirements. Micronutrients help in regeneration of cells, blood and fluids.

Dietary Management:

1. Since the patient have poor appetite initially food must be appetizing, provide enough protein, energy and also based on the likes and dislikes of the patients. Six smaller meals

- recommended instead of three larger meals.
2. During the acute stage, a high calorie diet fluid diet and soft diet are recommended. 500-750 ml of milk or yogurt should be consumed daily to ensure adequate intakes of Vitamin D and calcium.
 3. If the patient gets fever, fluid diet should be given once in 3 hours. When the fever comes down the intervals can be increased according to the patient condition. Adequate fluid intake at least 10-12 glasses per day are important.
 4. Pasteurized milk, custard apple, Indian gooseberry, pineapple, banana, orange, drumstick, bottle guard and mint are useful remedies for TB. 5-6 portions of fruits and vegetables should be eaten per day.
 5. The patient should avoid all devitalizing foods like White bread, white sugar and refined cereals, pudding and tinned, canned and preserve foods as well as they must avoid strong tea, coffee, condiments, pickles and sauces.

Modification of Nutrients:

- (A) Energy:** Since the metabolic rate is not as high as in other fevers, satisfactory weight gain is achieved with 2500 to 3000 kcal, so that high calorie diet is prescribed.
- (B) Protein:** A protein intake of 80 to 120g helps to regenerate the serum albumin level.
- (C) Minerals:** Calcium needed to promote healing of TB lesions. Especially Ca, Fe, Phosphorous helps in regeneration of cells, bloods and fluids.
- (D) Vitamins:** The whole metabolism of Vitamin A is adversely affected in TB. Carotene poorly converted to vitamin A. So the diet should be planned according to the needs of the patient. Inclusion of liver and vitamin A supplementation is essential for once a week.

Vitamin C is essential for many regenerative purposes thus orange juice is prescribed.

The goal of nutrition counseling is to improve the dietary intake during recovery:-

- to compensate for the increase in energy expenditure associated with recovery and weight regain
- to support the increase in cellular production and immune responses,
- to support repairing of damaged and diseased tissues,
- to manage the symptoms and side-effects of TB drugs, such as nausea and vomiting, anorexia, diarrhea and altered taste.

WHO RESPONSE

WHO has developed a guideline on nutritional care and support for people with tuberculosis. WHO is in the process of assessing the evidence and develop policy on social support and social protection for people with TB and TB affected households, including food support.

CONCLUSION

Adequate consumption of calories, proteins, macro and micro nutrients during tuberculosis recovery support the immune system and the biochemical reactions involved in the repair and restoration of cells and tissues. Nutrition support plays vital role to improve treatment outcomes in tuberculosis patients and promote their health in all the aspects and to make TB free India.

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