



NUTRITION AND TUBERCULOSIS: GOOD DIETS AS ESSENTIAL ELEMENT TO SUPPORT TB TREATMENT

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ABSTRACT

Improved nutritional care and support helps improve the health outcomes for people with tuberculosis (TB), hence, the aim of this research study and to provide guidance on nutritional assessment, advice and treatment for integration into clinical care for people with TB. Under nutrition and tuberculosis (TB) are linked and have a bidirectional relationship. Proper diet and nutrition play significant roles in treating TB patients. Active TB needs high energy requirement. The risk and morbidity of infections are influenced by the nutritional status of the individual. Likewise, the nutritional intake and utilization of foodstuffs are profoundly altered during the body's response to infection. An increase in protein breakdown and expenditure are thought to increase the requirement of micronutrient such as vitamin A, E, B6 and folate. It is also known that a decrease in trace element such as iron, zinc and selenium occur during TB. To effectively improve treatment outcomes of TB patients and reduce the burden of the disease, it is important to improve patients' knowledge, attitude and practice of good nutrition through nutrition education during therapy, provision of high nutrient supplements, ensuring regular availability of anti-TB drugs and compliance with treatment. Risk factors that prompt the reactivation of latent TB into active TB are a compromised immune system, malnutrition, and under-nutrition which play a major role in subverting the immune system and reactivating the latent TB infection. Under nutrition increases the risk of progression from Tuberculosis (TB) infection to active TB disease and further leads to weight loss. Proper diet and nutrition play significant roles in treating TB patients.

Key words: Nutrition, Tuberculosis, Patient, Malnutrition, Nutritional Support, Treatment, Diets, Nutrients,

INTRODUCTION

The role of nutrition care is integral to successful health promotion and disease prevention. Under-nutrition is both an important risk factor for, and a common consequence of T.B.

TUBERCULOSIS is a contagious disease related to poverty, under nutrition and poor immune function in 2012, there were an estimated 8.6 million new cases of T.B (13 contacted with HIV) there were 950,000 death due to T.B among people who were HIV negative and another.320.000 among people who were HIV positive.



There were also an estimated 0.5 million TB cases and 74000 TB deaths among children less than 15 years of age in 2012

T.B is an infection caused by bacterial micro organism “mycobacterium tuberculosis” mostly affected people living in crowded and poorly ventilated conditions, malnourished and who are immune compromised are most likely to become infected. And can be caused by person to person transmission mostly in a weak immune system: elderly and children, HIV, Alcoholics and I.V Drug abusers and in condition that promote infection such as malnutrition.

TRANSMISSION: TB is spread by droplets infection. This type of transmission means that a TB patient exhales, cough, or sneezes, tiny droplets of fluid containing tubercle bacilli are released into the air. This mist or aerosol and can be taken into the nasal passage of the lungs of a susceptible person nearby. To the alveoli of the lung into the cell where it multiply and spread through lymph vessels into the lymph nodes/ blood vessel. But by the reaction of the person’s tissue to its presence and to develop an immune response to the bacillus

NUTRITION

An essential dietary nutrition is a substance that a person needs to consume in order to live, grow and be healthy. Nutrition is required to regulate body processes and build and repair tissues and thereby promote health and prevent disease. Micronutrient and macronutrient work together to contribute to tissue regeneration and cellular integrity.

Nutritional factors that increase TB risk

Nutritional deficiency are generally associated with an increased risk for contracting TB and has an effect on the severity of the disease. The poorer the diet the likely is that a person will develop complication associated with TB

Nutritional response to TB, once infected with TB, start using more and more energy to fight the infection. An increase in protein breakdown and expenditure are thought to increase the requirement of micronutrient such as vitamin A,E,B6 and forlate. it is also known that a decrease in trace element such as iron, zinc and selenium occur during TB

Nutritional treatment in TB

The risk and morbidity of infections are influenced by the nutritional status of the individual. Likewise, the nutritional intake and utilization of foodstuffs are profoundly altered during the body’s response to infection.

Factors that affect food intake:

- Food availability
- Appetite
- Medication side effect
- Life style (smoking, alcohol, use of social drug)

Psychological factors

- Stress and depression
- Stigma
- Economical factors



Nutritional needs in TB

Energy: energy requirement of TB patient increased in order to maintain body weight by 20%-30%

Protein: protein is required to prevent the wasting of the body stores (Muscle tissue)

Micronutrient: a good multivitamin and mineral supplement is advisable in order to meet the increased requirement for vitamins and mineral due to poor appetite

Nutritional needs of children with TB

The rapid growth periods of infancy and childhood can only be maintained if a child's nutrient intake is optimal. Because of the risk between malnutrition and TB, all children presenting with malnutrition or with failure to gain enough weight must be evaluated for possible TB.

Children with TB need a lot of energy and nutrients since the child has increased requirement as a result of both growth and TB. The fact that children have limited stomach capacity and appetites makes it particularly challenging to meet the nutrient requirements. It is therefore necessary to modify and plan the diet carefully to ensure adequate intake of food.

Nutrition assessment and care are critical component of improving rehabilitation and quality of life of TB patients. The integration of recommendation regarding nutrition care and support may include scaling up and strengthening nutrition care infrastructure, coordinating public health services and investing in capacity building and training of health workers in the use of evidenced informed approaches to nutrition assessment and counselling.

MALNUTRITION: is a general term that refers to either over nutrition or under-nutrition or both. Under-nutrition refers to a state when the nutritional status of the person is suboptimal and thereby health and growth may be limited. Under-nutrition may be due to illness that impairs nutrient intake and metabolism, or result from inadequate intake of macronutrients, micronutrient or both.

UNDERNUTRITION: is commonly associated with illness and infections such as gastrointestinal disorder and mal-absorption, pneumonia, T.B and HIV.

TB AND UNDERNUTRITIONS

The association between TB and under-nutrition has been known. TB makes under-nutrition worse and under-nutrition weakens immunity. Thereby increasing the likelihood that latent TB will develop into active disease. Most individuals with active TB are in a catabolic state and experience weight loss and some shows signs of vitamin and mineral deficiency at diagnosis. Weight loss among those with TB can be caused by several factors, including reduced food intake due to loss of appetite, abdominal pains, nutrients loss from vomiting and metabolic alterations caused by the disease. Low body mass index (BMI) (Lower than 18.5kg m²) and lack of adequate weight gains with TB treatment are associated with an increased risk of death and can be an indications of severity of TB and poor treatment response.

MACRONUTRIENTS REQUIREMENT IN ACTIVE TB

Active TB, like other infections disease, is likely to increase energy requirement. Studies shows that subjects who receives food supplements during TB treatment tend to gain more weight companied with those not



receiving food supplements it is generally recommended that all people consume approximately 15 – 30% of dietary energy as protein, 25 – 35% as fat and 45 – 65% as Cho Carbohydrate.

MICRONUTRIENT REQUIREMENT IN ACTIVE TB

Low circulating concentrations of micronutrients such as vitamins A, E and D and the minerals, irons, zinc have been reported to cohorts of patients beginning treatment for active TB. These usually return to normal after 2 months of appropriate TB treatment.

TB AND PREGNANCY

Low birth weight, a predictor of infant morbidity and mortality, is more common in infants borne by women with TB. Infants of mothers with TB have increased risks of premature birth and prenatal death, while the mothers are more likely to have complications during pregnancy.

A health well-nourished woman should gain between 10kg and 14kg during pregnancy, the increase the likelihood of delivering a full – term infant weighting at least 3.3kg. Underweight pregnant woman (BMI less than 19kg/m³) can eat additional food, in order to achieve a total weight gain between 12.5kg and 18kg.

Regardless of the presence of TB, the material requirement for micronutrients during pregnancy tends to be 25-25% higher.

MACRO AND MICRONUTRIENT SUPPLEMENTATION FOR PATIENTS WITH ACTIVE TB

Optimal composition of diet the provision of food or high energy nutritional products may produce modest increase in weight gain during treatment for active TB and available studies shows that multi micronutrient probably have little or no effect in patient with TB as no studies have assessed the effect of multi-micronutrients on TB cure, or completion of treatment and probably have no effect on weight gain during treatment.

Plasma level of vitamin A appears to increase following imitation of TB treatment, regardless of supplementation.

- To determine whether household contact with poor nutritional status were at high risk of contracting or developing active TB disease, six studies on the risk of children in contact with people with active TB were identified. Two of the studies found that malnutrition and younger age individual increase the risk of household contacts developing active TB and it was difficult to determine the direction of influence active TB and failure to thrive and one of the study found that vitamin D deficiency was associated with increased risk of development of active disease in close contact.

Although under-nutrition is a risk factor for progression from TB infective to active TB disease, it is not known whether or with grows much Marco-or micronutrient supplementation reduces the risk of progression. Among young children who have had recent contact with a case of active Tb, it is not known whether nutritional supplementation in combination with treatment of latent TB infection significantly reduces the risk of progression to active TB more than treatment for latent TB infection alone.

The overall evidence base on effects of nutritional supplements for TB prevention and care remains very weak. It is not known whether nutritional supplementation as an additional to standard care, significantly



improved health outcomes among people with TB or prevent progression from TB to active disease. Owing to lack of evidence that people with TB should be provided to others, the recommendation in this paper is consistent with WHO'S general recommendation on nutritional care and support.

- Appropriate diagnostic procedures, support for TB patients to complete treatment and an appropriate combination of TB medications is crucial for curing the disease. The international standards for tuberculosis care are a widely accepted level of care that all practitioners should achieve in managing patients who have TB.
- An adequate diet, containing all essential macro- and micro nutrient is necessary for the well- being and health of all people, including those with TB infection or TB disease.

Consuming a well- balanced and adequate diet is key to maintaining optimal health and physical function at all age.

Nutritional status is an important determinant of resistance to infection and general well-being. It is well established that nutritional deficiency is associated with impaired immunity. While malnutrition increases susceptibility to infection, infection can lead to metabolic stress and weight loss, further weakening function and nutritional status. Vitamins A,C,D,E,B and folic acid and the minerals zinc, coppers, selenium and iron all play key roles in metabolic pathways, cellular function and immune function. The concentration of these nutrients may have a role in an individual defence against TB. Under-nutrition in the general population could dramatically reduce the incidence of TB.

- Because of the unclear bio directional causal link between under-nutrition and active TB, nutrition sere curing, assessment and management are integral components of TB treatment and care, many people diagnosed with TB are under nourished at the time of diagnosis and nutritious intervention and care begin with a nutritious assessment.

Nutrition assessment anthropometric (biochemical, chemical and dietary) is a prerequisite for the provision of good nutritional care. The result from screening and assessment inform counselling which is usually done at the time of diagnosis and throughout treatment. Trained PHC workers can play an effective and integral role in nutrition screening and can identity patients affected by under-nutrition and in need of further assessment.

Poverty and food insecurity are both causes and consequences of TB, and those involved in TB care therefore play an important role in recognizing and addressing these wider socioeconomic issues.

Food insecurity, which is common in TB patients, and concomitant poor nutritional status, contribute to the global burden of active TB. As an integral part of TB care and control, the health sector should recognized and help address generalized malnutrition, food insecurity and other socio economic determinant and consequences of TB.

NUTRITIOIN ASSESSMENT AND COUNSELLING

All individuals with active TB should receive

1. An assessment of their nutritional status.
2. Appropriate counseling based on their nutritional status at diagnosis and throughout treatment.



MANAGEMENT OF SEVERE ACTIVE MALNUTRITION

School age children and adolescents (5-19 yrs) and adults, including pregnant and lactating women, with active TB and severe active malnutrition should be treated with the WHO recommendation? For the management of severe active malnutrition.

All pregnant women with active TB should receive multiple micronutrient supplements that contain iron and iron and folic acid and other vitamins and minerals, according to the UN multiple micronutrient preparation And where calcium intake is low, Calcium supplementation as part of the antenatal care is recommended for the prevention of preeclampsia.

CONCLUSION AND RECOMMENDATIONS

- Household ingredients such as sugar, vegetable oil, peanut, eggs and non fat dry milk powder can be used in porridge, soups or milk based-drinks to increase the protein and energy content
- At least 500ml to 750ml of milk or yogurt should be consumed daily to ensure adequate intake of vitamin D and Calcium
- At least five to six portion of fruit and vegetables should be eaten per day. Pur fruit juice can be used to decrease the bulk of the diet. Approximately half a glass of fruit juice is equal to one portion of fruit.
- The best dietary source of vitamin B6 (pyridoxine) are yeast, wheat germ, liver, wholegrain cereals, potatoes, bananas and oatmeal.
- To encourage small, frequent meals with food high in protein and carbohydrate with consultation to dietitian in dietary composition.
- Encourage and provide frequent rest period
- Maximize nutrient intake to meet patient's metabolic requirement
- Isolation in private sanitary environment to avoid transmission
- Alcohol should be avoided
- Adequate fluid intake is important to increase losses (at least 10-12 glasses per day)
- A good multivitamin and mineral supplement
- Safe food handling and personal hygiene
- Meal should be appetizing in appearance and taste and provide enough energy and protein.

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