



Science

PRINCIPLES OF NUTRITION IN CANCER MANAGEMENT

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Abstract

Now a day number of cancer patients are increasing. There are many reasons for cancer development and eating habits is one of them. Of course, medical field has answer for cancer treatment. But they cause severe nutritional damage to humane body.

Proper nutrition care in cancer patient results in patient's health improvement and cancer recurrence chances are reduced. With help of this nutrition therapy patient can tolerate treatment and damage to body can be minimized.

Medical nutrition therapy has promising role in prevention of cancer. This article is a sincerer attempt to highlight importance of nutrition in cancer management.

Keywords: Nutrition; Cancer; Neoplasm; Therapy.

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1. Introduction

Cancer can be regarded as a disease of the body's cells. Its development involves damage to the DNA of the cells; this damage accumulates over the time. Characteristics of cancer-

Neoplasm: Tissue formation that serves no useful function.

Metastasis: Growth and spread of damaged cells.

In the study of principles of nutrition for cancer management, both the cause and the consequences of the cancer are important.

Carcinogenesis is a multistage process. It is described in three phases-

- Initiation – transformation of the cell produced by interaction of chemicals, radiation or viruses with cellular DNA.
- Promotion – initiated cell multiply to form a tumor.
- Progression – full malignant neoplasm. [1]

Goals of Nutritional Care

Following are goals of nutritional care in cancer management-

- Nutrition therapy may be supportive, adjunctive or definitive.
- Prevent or correct nutritional deficiencies.
- To minimize weight loss.
- Maintaining patient's strength and immune responsiveness.
- Early intervention is essential.
- Prevention of Cancer cachexia: wasting syndrome. [2]

2. Material and Method

For this review article, information given in concerned text is studied in detail. *K Park* and *Krause's nutrition therapy* books are having many references. Also relevant references are taken from other research article available on internet.

Considerations for nutrition plan-

Before making nutrition or diet plan following points are considered-

- Patient's age and type of cancer.
- Treatment side effects.
- Psychological complications like- depression and lack of motivation.
- Food and eating behaviors.
- Diarrhea
- Anorexia & weight loss.
- Taste and food aversion.
- Swallowing ability and saliva production.
- Nausea, vomiting and pain.

Role of Nutrients in Cancer-

- In chronic starvation, the metabolic rate is reduced as the body adapts to conserve energy and preserve body tissue.
- Maintenance of IBW is important.
- Cutting calories should be one of the simplest ways to reduce the risk of cancer.
- Obesity should be strictly checked.
- Synthesis of muscle protein is decreased in cancer, hepatic synthesis of secretory proteins, acute phase reactions, fibrinogen & immunoglobulin increased. [3]
- Red meat consumption should be limited- 1.5 gm. /kg body weight.
- Low fat is advised. Nature of fat: MUFA (canola oil, g.nut) over PUFA. [4]
- Tumors exert a consistent demand for glucose. [5]
- Neoplastic cells exhibit a characteristically high rate of anaerobic metabolism, yielding lactate as end product.
- This expanded lactic acid pool requires an increased rate of gluconeogenesis.
- Both protein breakdown and lipolysis take place at increasing rates to maintain high rates of glucose synthesis. Insulin resistance may develop.
- Selenium intakes have been found to be low in cases of various cancers, including breast, GI, colorectal, lymphomas and leukemia.

Vitamins-

- Low levels of Vit A - increase risk for skin cancer.
- Vitamin C & E and beta-carotene are anti-oxidants which help prevent cancer by inhibiting the formation and growth of tumours.
- Vitamin C enhances the immune system.
- Vitamin D found to make cells less resistant to chemotherapy.
- Decreased intake of Vitamin E is associated with lung, colorectal, stomach and bladder cancer.
- Deficiencies of lipotopes - B 12, folic acid, choline, methionine - may increase susceptibility to chemically induced cancers. [6]
- Potential cancer fighters are-
 - Catechins in tea
 - sulforaphane in foods like broccoli and cabbage
 - Amyl sulfides found in garlic and onion
 - Limonoids in citrus fruits
 - isoflavones in soy foods
 - Lycopene's in tomato & polyphenols in tea
 - b – cryptoxanthin, monoterpenes in orange juice. [7]

Therefore, food intake should contain- 6-11 - cereal serving, 2-4 fruit serving, 3-5 vegetable serving, 2-3 servings of meat, poultry, fish, dried beans, nuts and eggs, sparing amounts of fat. [8]

Nutritional Effects of Cancer Therapy-

- In chemotherapy -organs toxicities are seen, and dietary intake and nutritional status are adversely affected.
- Food intake is affected by cheilosis, glossitis, stomatitis, and esophagitis caused by many drugs.
- Nausea & vomiting may occur with antineoplastic agents.
- In Radiotherapy - Permanent xerostomia (mouth dryness).
- Radiation to thorax - esophageal stricture leading to obstruction.
- Radiation to abdomen - acute gastritis or enteritis with nausea, vomiting, diarrhea and anorexia. [9]
- Surgery is a primary mode of treatment for patients with GI malignant lesions. It may be combined with preoperative/post-operative adjuvant chemotherapy or radiation therapy.
- Surgery results in temporary or permanent dependence on tube feeding.
- Pancreatic cancer: if 70% or more pancreas is removed, insulin is required to regulate glucose metabolism, and CHO controlled diet should be given. [10]
- Total gastrectomy: leads to malnutrition secondary to reduced dietary intake and malabsorption. Hence jejunostomy feeding tube at surgery is advised, enteral nutrition is feasible within 4-5 days after surgery. [11]

Diet Modification-

- Oral intake may be encouraged with modifications of food and its presentation.
- Patients with dyspepsia, hypogeusia, may benefit from increased use of flavoring and seasonings during food preparation.

- Artificial saliva preparations and saliva stimulants are useful in cases of diminished salivation - foods with high moisture content and plenty of fluids should be given.
- The mornings are the best time to eat.
- This is due to sluggish digestion and gastric emptying as a result of decreased production of digestive secretions, GI mucosal atrophy, and gastric muscle atrophy.
- Frequent small feedings with emphasis on morning feedings are suggested in this case. [12]

Guidelines for Cancer Prevention-

- Eat variety of foods.
- Maintain desirable weight.
- Avoid too much fat, saturated fat and cholesterol.
- Reduce the amount of dietary fat to < than 30% of the total calories.
- Use low fat cooking method like steaming, broiling or baking, instead of frying.
- Eat foods with adequate starch and fiber.
- Avoid too much of sugar.
- Avoid too much sodium.
- Avoid alcoholic beverages.
- Be sure that there is enough Calcium in the diet. Take supplements if necessary.
- Consume proteins in moderate amounts. [13]

Following Should Be Avoided-

- Increased intake is associated with the risk of mouth, larynx, pharynx, esophagus, liver, colon, rectum and breast.
- Aflatoxins - naturally occurring poisons caused by moulds during the harvesting, shipment or storage of foods, particularly nuts, grains and seeds.
- Foods grilled at very high temperature, smoking, they produce free radicals which may be carcinogenic.
- Salt-cured, pickled and nitrite-cured foods may increase the risk of cancer. [14]

3. Conclusion

Nutrition therapy is very effective role in prevention and management of cancer. Cancer treatment side effects can be minimized with the help of proper and balanced nutrition.

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