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Review Article

The Role of Dietary Factors in Cancer

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ABSTRACT

Cancer is one kind of disease resulting from abnormal cell growth. Every year, millions of cancer causes of death around the globe. There are many risk factors being responsible for formatting cancer cells, including genetics, diet, immune, physical activities, environmental, radiation related and others. The role of dietary factors on cancer is a great public health importance. Dietary factors are associated with increases and decreases to the several types of cancers in the human body. This paper summarizes a view of the current status of dietary factors on cancer cells. Consumption of mostly fruits and vegetables, whole grains, fiber rich foods, legumes, nuts, seeds and low fat dairy products each day with limited consumption of high-fat foods from animal sources, alcohol and adequate physical activities can be reduced the risk of cancers. Besides, cancer causes a hypermetabolic situation, so a cancer patient should be needed proper nutritional care, including high calorie, high protein diets to maintain health and immune defenses while fighting cancer. This meta-review makes specific recommendations to reduce the risk of major cancers and a new concept of the role of dietary factors on cancer prevention research and policy must be developed. The present study generates information which indicates that the importance of dietary factors in cancer cells and dietary factors on cancer should not be overlooked and studies elaborately in the future.

Keywords: Diet; Cancer; Nutrition; Health; Review

INTRODUCTION

Cancer is not a single disorder. It is a disease resulting from abnormal cell growth. Each year, more than 10 million cancer cases occur in the world and it is one of the leading causes of death around the globe. There are several types of cancer with unusual characteristics, including carcinoma cancer begins in the skin or tissues, sarcoma cancer begins in bone, muscle, blood vessels or other connective tissue, leukemia is a cancer that begins in blood-forming tissue and produced abnormal blood cells. Lymphoma and multiple myeloma cancers create in the cells of the immune system and malignancy cancer found in the tissues of the brain and spinal cord. These cancers occur in different body locations. It is a general term for more than a hundred types of malignant disease. It is caused by a relation of identified and unidentified factors, but the most key recognized cause of cancer is tobacco use [1]. There are many risk factors are responsible for formatting cancer cells, including genetics, diet, immune, physical activities, environmental, radiation related and so on. Dietary pattern with physical activity may occur nearly one-third of all cancers. According to World Cancer Research Fund (WCRF) and American Institute of Cancer Research (AICR) that approximately 35% cancers could be prevented by proper diets, weight control, physical activities and avoid smoking. On the other hand, a cancer patient should be needed proper nutritional care, including high calorie, high protein diet because protein helps to ensure growth, repair body tissue and maintain a healthy immune system. Research estimates that consume a balanced diet that provide the nutrients needed to maintain health while fighting cancer. It is known that cancer causes a hypermetabolic situation, so lacking

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of sufficient nutrients body is poorly set to maintain immune defenses [2].

LITERATURE REVIEW

Dietary aspects related to cancer

Diet can play an important role to raise cancer risk and most likely reduce cancer risk as well. That means dietary factor is not only one of the key factors is responsible for the development of cancer cells in our body, but also it can reduce the risk of cancer cell growth. A proper diet is important not only in cancer prevention, but also in the cancer therapy. It is estimated that malignancy comes with by various micronutrient deficiencies. For this reason, a cancer patient needs particular nutrients and this mainly affects to a cancer patient undergoing radiotherapy or chemotherapy process. Research has been shown that dietary factor is responsible for 30% cancer in western countries. On the other hand, 20% cancer is responsible in developing countries. The World Cancer Research Fund (WCRF) reveals that approximately 30%-40% cancers can be prevented by appropriate diets, change in consumption pattern and physical activities [3]. Previous research reveals that almost 40% of male cancers and 60% of female cancers are related to dietary factors. Another study shows that 30% to 40% cancer risk can be reduced by plant based diets than the animal based diets. Furthermore, it is important for intake colored fruits and vegetables, which are much healthier beneficial, rich source of antioxidant nutrients, such as vitamins A, C, E, lycopene, carotenoid, mineral selenium and other nutrient compounds which can protect the cells of the human body against damage, slow down the formation of malignant action and so on. Research illustrated that dieting factor specifically, food nutrients can help in reducing cancer cell growth by antioxidant activity, reducing free radicals, stimulation of the immune system and so on. The consequence of diet on cancer risk is an enormous public health issue (Table 1 and Figure 1).

Table 1: Shows diets related risk factors and most likely reduce cancer risk factors for some familiar cancers. Cancer cells develop in an uncontrolled manner and finally it spread throughout the body.

Cancer(s)	Diet-related risk factors	Diet-related most likely reduces risk factors
Oral cavity	Alcohol	Probably fruit and vegetables
	Very hot drinks	
	Obesity	
	Salt-preserved foods and salt	
Pharynx	Alcohol	Probably fruit and vegetables
	Very hot drinks	
	Obesity	
	Chinese-style salted fish	
Esophagus	Alcohol	Probably fruit and vegetables
	Very hot drinks	
	Obesity	
	Chinese-style salted fish	
Liver	High alcohol intake	None established
	Foods contaminated with aflatoxin	
Larynx	Alcohol	None established
Lung	None established	Possibly fruit and vegetables
Stomach	Probably a high intake of salt-preserved foods and salt	Probably fruit and vegetables

Colorectal	Obesity	Probably fruit, vegetables and other plant foods rich in fiber
	Possibly red, and processed meat	
Breast	Obesity after menopause	Probably vitamin-A, E, B6, B12
	Alcohol	
Bladder	Water thinned out the concentration of carcinogens	Water and other fluids

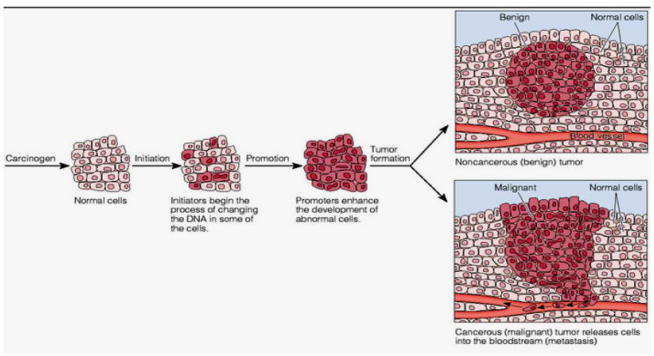

Figure 1: Shows that how the cancer cells is developed.

Dietary factors: Increase cancer risk

The following dietary components have been associated with increased cancer risk:

Fat diets and cholesterol: Saturated fat and trans-fatty acid increased risk of cancer. There are different types of cancer of the breast, colon, lung, rectum, prostate and so on may be associated with saturated fat and trans-fatty acids. It is known that fat is calorie dense and it is very hard to distinguish between the effects of high fat diets and total calories. So, increasing obesity, bile acid production, estrogen levels may increase cancer risk. Research reveals that intake of high fat diet can be enhanced with the structure and degradation of bile acid production in colon carcinogens and also dietary fats increased the fecal concentration of bile acids. Intake of high dietary total fat is one of the risk factors of developing cancer cells, especially in breast cancer [4].

Over-consumption of energy (Obesity): Obesity is one of the major risk factors for cancer. It is known that overweight or obesity is a reflection of too much energy intake and one of the main risk factors for cancers is intake too many foods. According to Calle, et al. reveals that overweight or obesity accounted for 14% of all cancer deaths in men and 20% of those in women from a potential cancer prevention cohort and recent study estimated there is a major relationship found between obesity and higher death rates for the cancers, including esophagus, colon and rectum, liver, gallbladder, pancreas, kidney, stomach, prostate, breast, uterus, cervix, ovary and so on. The research also illustrates that more and less 1,00,000 cancer deaths could be avoided each year if matures, people all maintained a normal weight of Body Mass Index (BMI<25.0). In most epidemiological studies shows that high calorie intake increased the risk factor of the breast, colon and endometrial cancer. Another decent research estimates that almost 50% postmenopausal women had breast cancer risk for obesity, maybe by increasing serum concentrations of free estradiol [5].

Alcohol and alcoholic beverages consumption: Alcohol consumption is one of the key risk factors to increase cancer risk. Some previous researches illustrate that alcoholic beverage like beer has the strongest link to colorectal cancer. According to the IARC, 1988-consumption of high alcoholic beverages increases the risk of cancers of the liver, breast, oral cavity, pharynx, larynx, colorectal and esophagus. Now-a-days, the research reveals that the higher risk of colon, liver and breast cancer is prominent with alcohol consumption. Although, some doctors or scientists expose that moderate alcohol consumption, especially red wine, may have benefits for health, on the other hand, there are vast, realistic data shows that too much alcohol intake with an increased risk of the breast, colon, liver, oral and esophageal cancers. One of the current studies mentioned there is a 7% increased risk of breast cancer with every 10 grams of alcohol consumed per day.

Red meat and preserved meat: Too much red meat and preserved meat sources of protein intake have been implicated to increase one of the major risks of colon and prostate cancer. One of the studies mentioned that an important positive link has between red meat and colorectal cancer. Another study shows that a high intake of red meat and preserved meat has been associated with increased risk of colorectal cancer. Consumption of red meat and processed meat with the heterocyclic amines, N-nitro's compounds and poly-aromatic hydrocarbons associated not only colorectal cancer in many but also rectal and breast cancer too. Actually, red meat and preserved meat, depending on the form of processing and cooking methods such as grilling, broiling and barbecuing and it may be a source of heterocyclic amines, N-nitro's compounds and poly-aromatic hydrocarbons, all of which have been linked to carcinogenesis. In the early 90's, one of the researches shows that a high intake of preserved meat and red meat was associated with higher risk of colorectal cancer after adjusting for energy intake and age, but not after further adjustment for BMI, smoking and other things [6].

Sweeteners (sucrose, saccharin, aspartame, etc.): Research shows that some sweetener components are not carcinogenic itself, but when it mixed with saccharin, it produced certain type of tumors in experimental animal. It is known that saccharin in

high doses promoted tumors of the bladder. Some countries banned saccharin, but it's a matter of sorrow that instead of saccharin, other artificial sweeteners still exists and it is experimented that one of the sweeteners named aspartame was sold under the name of nutra-sweet. It is harmful and has been associated with increasing lymphoma and leukemia in rats and brain tumors. Now-a-days, one of the new artificial sweeteners named acesulfame-k found in baking products and gelatin and it may be associated with kidney tumors (Figure 2).

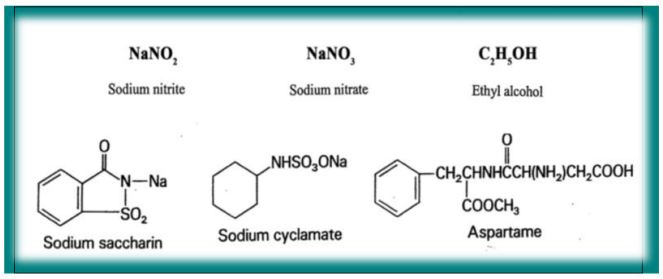

Figure 2: Chemical compounds found in food and which are implied in increased cancer risk.

Food additives, antibiotics, pesticides and herbicides: Growth hormones and antibiotics used in animal based foods, pesticides or herbicides used in plant based foods and chemical and chemical compounds used in food that enter the food from packaging can increase cancer risk. Some pesticides and food additives is safe at the levels permitted on fruits and vegetables. But they may be carcinogenic at extremely high doses, and the benefits of intake fruits and vegetables are far greater than any potential risk. Recently, agriculture and animal husbandry invented lots of chemicals and bio-chemicals such as fertilizers, pesticides, hormones, antibiotics and so on, which may contaminate and affect not only the quality of food but the safety of food as well. Although, invented all chemicals and bio-chemicals products are not harmful to human health and risk for cancer but several of the pesticides, hormones, antibiotics in foods may be associated with the risk of cancer in the human body. Various food additives like, synthetic antioxidants usually used in food processing to extend shelf-life, prevent contamination, improve flavor and these may associate with the risk of cancer [7].

Omega 3:6 fatty acids ratio: Research shows that omega-3 fatty acids such as, alpha-linolenic acid, EPA, DHA is good for human health and it is safe from cancer risk, on the other hand, omega-6 fatty acids such as, linolenic acid, arachidonic acid is found to be cancer promoting fats. Another study reveals that regarding omega-3 and omega-6 fatty acid ratio, omega-3 fatty acids are better than the omega-6 fatty acids and it reduced risk of breast cancer because of long chain reaction, different effect, fat quality and so on. It is known that long-term poultry and fish dieting inversely associated with the risk of both proximal and distal colon cancer. The statistical study illustrates, there are second leading cancer related deaths in men is prostate cancer. Previous studies show that the consumption of polyunsaturated acids, which is omega-6 fatty acids associated with the growth of prostate cancer. Overall, large amounts of omega-6 fatty acids have been associated with increased the risk of prostate cancer, whereas omega-3 fatty acids exposed to slow down prostate cancer risk.

Low fiber diets: A low-fiber diet means intake foods that do not have a lot of fibers. Dairy products, eggs, meat, refined grain products, etc. contain no fiber. From time to time, dietary fiber removed from refined grain products. In a word, animal based diet and refined grains are low in the dietary fiber. Researchers estimate that a low fiber diet including refined grains and animal based diet associated with increased risk of rectal cancer. On the other hand, vegetable, fruit and whole grain food intake are good for human health and not to associate with rectal cancer [8].

Aflatoxin: Study reveals that food contaminated with aflatoxin increases liver cancer risk, although the contamination occurs generally in areas where hepatitis viruses are associated with the liver cancer. Another research estimates that the functions of hepatitis-B virus and aflatoxin B1 on the list of human carcinogens and responsible for of liver cancer. Overall, a number of epidemiological studies find out there is a positive relationship between dietary aflatoxin and liver cancer. Table 2 Indicates the health effects of aflatoxin.

Table 2: The health effects of aflatoxin.

Alfatoxin and its biological health effects	
Alfatoxin	Health effects
	Type 1 carcinogen
	Causes liver cancer
	Interacts with HBV (Hepatitis B Virus)
	Binds with DNA mutagenic
	Linked with kwashiorkor in children
	Linked with immune suppression
	Linked with stunting in children

Salt and salt processed foodstuff: It is known that salt is not carcinogenic by itself but high intake of salt and salt processed foods in the diet increasing the risk of stomach and throat cancers. One of the epidemiological studies illustrate that high intake of Chinese style salted fish mostly consumed in some Asian people convincingly increases the nasopharyngeal cancer risk. Previous studies have shown that a positive relationship between gastric cancer and the intake of high salt processed foods such as salted fish, cured meat, salted vegetables and so on. A high intra-gastric salt absorption demolishes the mucosal barrier which leads to inflammation and damage such as diffuse erosion and degeneration.

Very hot drinks and foods: Very hot drinks and foods such as tea, coffee, soup consumption; there is a possibility to increases the risk of the oral cavity, pharynx and esophagus cancer. The most important factors are involved in esophageal cancer are the habits of very hot tea and foods are consumed and these may damage the lining of the esophagus; thermal irritation may have a role in gastric carcinogenesis [9].

Polycyclic Aromatic hydrocarbons (PA-hydrocarbons): Scientifically proved that polycyclic aromatic hydrocarbons or PA-hydrocarbons compounds are generally found in tobacco smoking. Many previous researches reveal that dietary PA-hydrocarbons are distributed to organ (besides the locally exposed tissues) and associated with lung or breast cancer risk.

DISCUSSION

Dietary factors: Most likely reduce cancer risk

The following dietary factors may have been associated with decreased the risk of cancer:

Change the consumption pattern: Change the consumption pattern, it means; change from an animal-based diet to a plant-based diet. Plant based diet have three health-promoting factors, such as less fat, more fiber and phyto-nutrients. Recent past, several studies illustrated that the people who have taken plant based diets, have much lower risk of cancer diseases. Plant based foods, fiber, legumes, such as seeds, rice, soybeans, beans and chick peas provide anti-cancer properties and contain natural components with cancer-preventive properties [10].

Fruits and vegetables: Scientifically explained that dietary factors may have been associated with decreased cancer risk. Several case studies reveal that daily consumption of fruits and vegetables may have been associated with lower risk of cancer. Furthermore, adequate intake of fruits and vegetables probably reduces the risk of the oral cavity, esophagus, lung, stomach and colorectal cancers. Scientific evidence shows that fruits and vegetables containing form of a supplement which might be construed to reduce the risk of cancers. Fruit and vegetables content polyphenols and fibers and as it is proved that polyphenols and fibers have a protective function in cancer cells, including colorectal cancer and breast cancer. Current research expected that more than 30% of women with high fruit fiber intake probably reduces the breast cancer risk. Fruit fiber may protect from carcinogenesis by developing insulin sensitivity and counteracting weight gain. Scientific evidence has been shown that high dieting food like fruits and vegetables is associated with a lower risk of breast cancer. Different human epidemiologic studies expected that there is a massive relation between colorful fruits, different kind of vegetables (raw, alliums, green cruciferous, tomatoes and so on) and cancer and these fruits and vegetables have a protective effect from cancer like, cancers of the stomach, esophagus, lung, oral cavity, pharynx, endometrium, pancreas and colon.

Water and other fluids: Some research has been revealed that the consumption of water and other fluids may reduce the risk of bladder cancer. Another medical research illustrated regarding the risk of bladder cancer as water thinned out the concentration of carcinogens and decreases the period in which they are in touch with the bladder lining and the medical epidemiologic study suggested that everyday drinking at minimum 4 to 5 liter of water/fluid regularly may be beneficial to reduce the risk of bladder cancer.

Dietary fiber: Dietary fiber helps to protect colon or colorectal cancer. It is established that dietary fiber has been diluting would be carcinogens and keep the momentum of their transit through the colon. Dietary fibers contain low fat, which may useful to protect against colon cancer by reducing bile acid production. There are two types of dietary fibers, one is water soluble and another is water insoluble. Science confirms that water soluble fibers delay starch absorption, stabilize the serum insulin level that might responsibly and increase the intestinal tumerogenesis. According to Potter 1999, when the dietary fibers are in the process of fermentation, they produce H_{2O}, CO_2, CH_4, H_2 and Short Chain Fatty Acids (SCFA) and out of different short chain fatty acids, butyrate may have the remedial effect on colon carcinogenesis. On the other hand, Roeidger 1982 also established that it is important for prevention of colon cancer when butyrate is present in the distal colon. He also added that tumors are the common factor in the human body and most of the tumor in humans occur in the distal colon.

Vitamin C: Vitamin C is an antioxidant itself. It is very much essential for boosting up the immune system of the human body by increasing the production of lymphocytes. It is also helpful for neutralization of carcinogenic nitrosamines and fecal mutagens. Many epidemiological studies reveal that there is a correlation between cancer and vitamin C and vitamin C can protect and reduce the formation of the cancer cells. It can protect not only the cancer of esophagus, stomach, rectum and pancreas, but it may also protect from developing cancers of the breast, cervix and lung. Vitamin C blocks the toxic effects of carcinogens for instance, polycyclic hydrocarbons, organochlorine pesticides and heavy metals as well as it blocks the formation of nitrosamines in the gut. Epidemiological research has illustrated that higher intake of vitamin C has the lowest chance of intestinal cancers. Research reveals that intake

approximately 1 to 2 grams/day of vitamin C may have protected from cancer risk. In a word, it has been seen that vitamin C is correlated with overall good health and cancer prevention [11].

Vitamin B6 and vitamin B12: Various epidemiological evidence has been revealed that vitamin B6 and vitamin B12 could be beneficial for anticancer agents and it is an essential nutrient for carcinogenesis, genetic stability, DNA repair and
cancer therapy. Many studies illustrated that vitamin B6 and B12 have a significant reduction in colon, rectal and breast cancer.

Vitamin E: Most of the researchers express their opinion that the anticancer properties of vitamin E are comparable to vitamin C. Different epidemiological researches have been indicated that vitamin E has the positive impacts of reducing the cancer risk, especially in colon cancer and prostate cancer as well. Various experimental studies illustrate those men with vitamin E rich foods in their diet showed more and less 30% of lower risk of all sorts of cancer. On the other hand, those women with intake less vitamin E in their diet had ten times the risk of breast cancer.

Vitamin D: It is known that vitamin D gets from sunshine and it also gets from diets such as milk, fortified milk and other food nutrients. Many epidemiological studies found that vitamin D has anticancer properties which are very much effective for reducing the cancer risk. Vitamin D restrains the development of colon or colorectal and prostate cancer cells. It is also associated with the lower risk of breast cancer for women whose diets are high in vitamin D.

Beta (β) carotene: Beta carotene ($C_{40}H_{56}$) is a red orange mixed pigment usually found in colorful fruits and vegetables and it has a tremendous free-radical trapping agent, which can be reduced the risk of colon, stomach, prostate, lung, cervix cancers. Sweet potatoes, carrots, pumpkins, butternuts, winter squash, spinach, broccoli, pink grapefruit, ripe mango, papaya etc. contains a lot of beta carotene. Vitamin A food supplements found in beta carotene. Scientific evidences showed that beta carotene has great positive impacts associated with the protection of lung cancer even in smokers.

Folate/Folic acid: Mostly, folic acid comes from fruits and vegetables and it is good for reducing certain types of cancer risk and it contains numerous vitamin supplements which can be reduced the risk of colon cancer. A number of epidemiological studies have shown that a higher folic acid intake diet can be decreased in colon, rectal and breast cancer risk. Studies have shown that women, those consumed alcohol with frequently higher intake of folate may have protected effect of breast cancer. A folate less diet can be responsible to carcinogenesis by alteration of gene expression and chromosome breakage. It is also responsible to carcinogenesis by enhancing DNA damages as folic acid has an important role in DNA synthesis.

Cruciferous vegetables: Cabbage, broccoli, cauliflower, sprouts, etc. are cruciferous vegetables. These vegetables contain lots of essential nutrients, amino acids, enzymes and other properties which have anti-cancer. Several epidemiological studies found that cruciferous vegetables can be decreased breast, colorectal, prostate cancers risk. It is known that broccoli sprouts have a very high concentration of sulforophane and it is highly cancer protective, thus broccoli called anti cancer food.

Calcium/Foods containing calcium: One of the observational studies suggested that a higher intake of calcium or foods containing calcium can be condensed the risk for colorectal cancer by forming complexes with secondary bile acids in the intestinal lumen. In addition, it can be controlled destroy to intestinal lining cells in the human body by forming insoluble compounds with fatty acids and bile acids. Therefore, it is proved that calcium strongly deals with the increases of epithelial cells lining the colon. Most epidemiological studies revealed that calcium rich foods associated with the diminution of breast and colorectal cancer. Furthermore, one of the observational studies recommended that the people in Sweden with a high intake of calcium have a lower percentage of colorectal cancer risk. Other innovative studies expressed that average intake of 1200 mg. calcium per day can be reduced 75% of colorectal cancer risk. On the contrary, some studies suggested that calcium rich foods may raise the risk of prostate cancer.

Phytochemicals: Phytochemicals are naturally occurring and biologically active chemical compounds which provide color, aroma, flavor in fruits and vegetables. It is a good supplier of vitamins and antioxidants. There are many types of phytochemicals, for instance flavonoids, carotenoids, isothiocyanates, indoles, polyphenols, phytoestrogens, terpenes etc. Cruciferous vegetables, onions, garlic, soy and soy products, green tea, berries and many other fruits and vegetables contain phytochemicals known as anticancer agents and associated with reduced the growth rate of the carcinogenic process. Table 3 illustrates few examples of phytochemicals and their food sources [12].

Table 3: Examples of phytochemicals and their food sources.

Class (subclass)	Phytochemical	Food source
Carotenoids (Carotenes)	Beta-carotene, lycopene	Carrots, dark leafy greens (spinach), tomatoes
Carotenoids (Triterpenoid)	Saponins	Soybeans, beans, other legumes, corn, alfalfa
Polyphenols (Curcuminoids)	Curcumin	Turmeric, mustard

Polyphenols (Flavonoids)	Quercetin	Cranberries, apples, red and yellow onions, beans
Polyphenols (Isoflavonoid)	Isoflavones (Phytoestrogens)	Soybeans, alfalfa sprouts, chickpeas, peanuts
Polyphenols (Stilbenoids)	Resveratrol	Grape skins and seeds, nuts, peanuts

Antioxidants/Diet high in antioxidants: Fruits and vegetables are the main resources of antioxidants. Vitamin C, vitamin A, vitamin C, beta carotene and the trace mineral selenium contain antioxidants as identified to reduce the risk of different types of cancers and can be blocked the growth of potentially cancerous cells. Scientific evidence showed that antioxidants protect the membrane of intestinal cells, boosts up the immune system in the human body, and they also prevent free-radical reactions, which can be diverted to carcinogenic. In addition, antioxidants prevent imperfect metabolism in the cell that can be predisposed a cell to carcinogenic. Table 4 shows the health benefits of antioxidants and their food sources.

Table 4: The health benefits of antioxidants and their food sources.

Antioxidants	Health benefits	Food sources
Selenium	Boost up immunity, works with vitamin E to protect cells from damage. Reduces the risk of cancer, particularly lung, prostate and colorectal	Garlic, seeds, Brazil nuts, eggs, poultry, seafood, whole grains. The amount in plant sources varies according to the content of the soil
Beta-carotene	Keeps skin healthy, helps prevent night blindness and infections, promotes growth and bone development, contain anti-cancer properties	Red, yellow-orange and leafy green vegetables and fruits, including carrots, apricots, tomatoes, spinach, broccoli, sweet potatoes and pumpkin etc
Vitamin E	Reduces risk of colorectal, breast and prostate cancer, heart disease and other age-associated diseases	Peanut butter, nuts, seeds, vegetable oils and margarine, egg (yellow portion), avocado, whole grains, salad dressings
Vitamin C	Reduce risk of cataracts, heart disease, boosts up the immune system and destroys free radicals inside and outside cells. Helps in the formation of connective tissue and helps to prevent bruising and keep gums healthy. Reduce the formation of the cancer cells	Peppers, tomatoes, citrus fruits and juices, berries, broccoli, spinach, cabbage, potatoes, mango, papaya

Selenium: Selenium is one kind of mineral and it has high anti-cancer properties. Garlic, seeds, nuts, eggs, cottage cheese, chicken, seafood, whole grains, etc. is the selenium rich foods. Research showed that dietary intake of selenium may reduce the risk of lung, prostate and colon cancers. One of the major tasks of selenium is that it can change various cancer mechanisms. Several prospective researches suggested that lower levels of selenium in their blood may increase the risk of colon cancer.

Soy products/Soy flavonoids: Soy and soy products are a more healthful source of protein than meat. Soy products/soy flavonoids can slow down the increase rate of new blood vessels necessary for tumor survival. Soy products like soybeans have important phytonutrients, quercetin, anthocyanidin which have estrogenic properties associated with the diminution of cancer risk, especially breast and prostate cancer. It also protected against colon cancer. Scientific evidence exposed that women, those intake more soy products in their diets associated with reduction of the risk of breast cancer. Figure 3 shows that soy flavonoids help to control cancer growth.

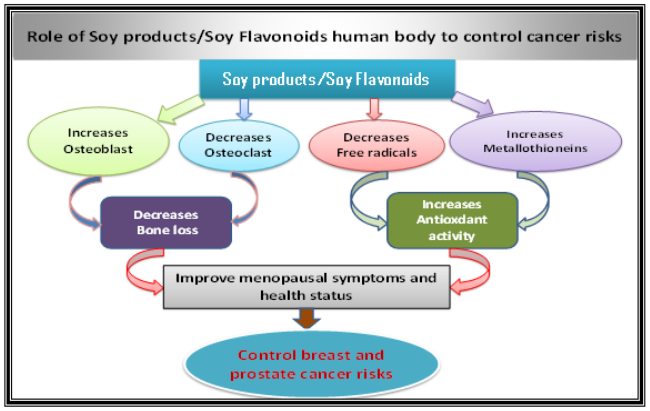

Figure 3: Soy flavonoids help to control, breast and prostate cancer growth.

Garlic and onions: Research indicates that garlic and onion based vegetables have some essential active components which are very essential for health and treat as an anticancer properties such as diallyl sulfide, diallyl di-sulfide and diallyl tri-sulfide, may

decrease the risk of cancer. One of the experimental studies suggested that the people who intake more garlic in their diets have a lower possibility of stomach, prostate, throat and mouth, kidney and colorectal cancer.

Green tea: Green tea is beneficial for our health. Green tea contains antioxidant molecules called catechins and anticancer properties called epigallocatechin gallate. Research has been suggested that green tea can reduce the growth of cancer cell.

Berries: Berries are (such as strawberries and raspberries) very nutritious for health. Berries contain phenolic acid. Phenolic acid can control cancer risk and it is very much helpful to decrease the risk of a breast and lung cancers.

Nutritional care of cancer treatment patient

Scientific epidemiological studies illustrated that cancer treatment generally, the use of surgery, radiation, medications and other therapies. The main objectives of the cancer treatment are:

- Stop the progression of a cancer.
- Diminish a cancer.
- Cure a cancer.
- Finally, allowing living a normal life span.

There are many cancer treatment options available in the world, such as surgery, chemotherapy, radiotherapy, immunotherapy, hormone therapy and so on. Studies suggested that a cancer patient needs a higher calorie with high protein diet because cancer causes a hypermetabolic state. Malnutrition or less nutrient intake cannot be prepared to maintain immune defenses and organ functions and also cannot be prepared to repair damaged tissues during cancer treatment. It is important that recommended daily allowances, energy intake for an adult with good nutritional status almost 2000 kcal, for malnourished patient almost 3000 kcal-4000 kcal with 45 kcal/kg-50 kcal/kg body weight to be needed. Furthermore, recommended daily allowances protein intake for an adult with good nutritional status more or less 90 g to be needed during cancer treatment. Vitamins and minerals also recommended to intake as much as the possibilities during cancer treatment as it is known that vitamin is protected and reduced the cancer risk [13].

CONCLUSION

Now-a-days, the role of dietary factors in cancer risk is a great public health importance and dietary factors associated with increases and decreases to several types of cancers. These days, diet and cancer related theory established that cancer is one of the most preventable disease. In this paper, summarize a view of the current status of dietary factors on cancer risks as well as identify the dietary factors that might play a key role in developing and reduce of cancers. Scientific evidence suggested that simple changes in diet and daily life can be prevented in many cancers. Consumption of mostly fruits and vegetables, whole grains, fibers rich foods legumes, nuts, seeds and low-fat dairy products each day with limited consumption of high-fat foods from animal sources, alcohol and physical activities can be reduced the risk of cancers but available data can often be inconclusive and might be different according to hormonal status. On the other hand, it is not so easy to fulfill a nutritional demand of a cancer patient while cancer treatment is going on because cancer patients often have increased nutritional needs. Plenty of epidemiological research revealed that to consume of a different kind of nutrient rich foods such as, high-calorie, high-protein foods needed to maintain health while fighting cancer. Most of the diets on cancer related researchers mentioned that a new concept of the role of dietary factors in cancer prevention research and policy must be developed. This meta-review summarizes dietary factors on cancers and makes specific recommendations to reduce the risk of major cancers in the human body.

RECOMMENDATIONS

The major recommendations for reducing the risk of cancer cell grow are as follows:

Be a healthy weight: Our Body Mass Index (BMI) is in the range of 18.5-24.9 as normal and avoid weight gain not more than 5 kg during adult life. It is important that maintain regular physical activity and sit less.

Change consumption pattern: Change consumption pattern and enjoy more vegetables, fruits, grains, fibers and beans than red and processed meat and eat at least 400 g per day of total fruits and vegetables.

Limit red meat and avoid processed meat: Too much red meat and processed meat sources have been mixed up to increase the cancer risks.

Eat less salt: Consumption of salt and salt preserved foods should be reduced. Chinese style fermented salted fish should be controlled to consume.

Avoid high calorie foods and sugary drinks: It is advised to moderate consumption of high calorie foods and sugary drinks, but it's better to avoid sugary drinks and high calorie foods.

Minimize exposure to aflatoxin in foods: It is proved that food contaminated with aflatoxin increases cancer risks. So, it is better to minimize exposure to aflatoxin in foods.

Do not drink alcohol: It is known that alcohol causes cancer. We should avoid consumption of alcohol and alcoholic beverages for getting free of cancer.

Do not consume very hot foods and drinks: Do not consume foods or drinks when they are very hot temperature. Consume very hot foods and drinks increase the risk of cancer.

Do not rely on supplements: Too much consumption of supplements may be increased cancer risks. So, we should not be relying on supplements.

Do not smoke and chew tobacco: Smoking and tobacco causes cancer. Several scientific studies suggested that do not smoke and chew tobacco as it is a great chance to increase the cancer risks.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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