**UNMASK CANCER**

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**ABSTRACT: -**

Cancer is the number one cause of death worldwide. The term ''cancer'' is nonspecific, indicating a wide spectrum of diseases can affect any part of the body. A malignant growth developed into cancer. Tobacco usage accounts for around one-third of all cancer-related deaths to date. excess simple sugar consumption, alcohol consumption and sedentary life style. Cancer can currently be prevented by avoiding risk factors. Healthy life style, nutritious food, regular health checkup all these are helpful for cancer management. Different cancer or malignancies burden are reduced through early detection and chemo therapy. Cancer patient mostly need palliative care, that means good food, proper care, manage spiritual and psychological health. Keto diet plays important role in cancer patients. Obese people who are prone to cancer, if they made a habit of antioxidant rich food consumption they will be benefitted. So, making healthy choice can play vital role in today’s life.

*Keywords: - cancer, malignancy, tumor, chemo therapy, Mediterranean diet, ketogenic diet.*

**INTRODUCTION: -**

A group of more than 100 different diseases is called cancer. Cancer arises when genetic abnormalities disturb the normal mechanism. The cells tend to expand indiscriminately. These cells can form tumors. A tumor might be cancerous or benign. A tumor that is cancerous is malignant, meaning it is capable of spreading throughout the body. Though it does not spread, a tumor that is not cancerous can grow. Cancer is horrible, ever-growing, and extremely strong sickness that affects the entire cosmos. It has no definite cure. Many studies are showing a strong relationship between diet and the risk of cancer development. There is no such evidence which shows that any specific food can cause or cure cancer but high saturated fats, refined carbohydrates, low fiber foods increase serum glucose level which are associated with breast, stomach and colon cancer. Food plays an important role during, before and after cancer treatment. One of the leading causes of cancer is an excessive consumption of food. Obesity increases the incidence of malignancies, but consuming less food provides a preventive effect. There are no anti-cancer diets that promise cancer cures, however a handful have demonstrated a potential decrease in cancer incidence.

Good nutrition is essential for cancer patients.

The process through which food is digested and utilized by our bodies to support growth, preserve health, and replenish tissues is known as nutrition. Proper diet is vital for overall health. A healthy diet includes meals and beverages that include essential elements (vitamins, minerals, proteins, carbs, fats, and water) that the body requires. Each cancer patient has specific nutrition goals. Nutritional goals during cancer therapy are determined by a patient's cancer kind, stage, and other medical factors. In order to heal, fight infection, and have adequate energy, one must consume the proper amounts of calories and protein. Malnutrition can result from cancer and cancer therapy. Cuisine, feel, desire to eat, and the capacity to consume sufficient nourishment or absorb nutrients from it can all be impacted by cancer and its therapies. A shortage of vital nutrients can cause malnutrition, which is a disorder that can result from it. Malnourished people may feel weak, fatigued, and struggle to fight pathogens or complete cancer treatments. Malnutrition can thus have a disastrous impact on one's quality of life. If the cancer advances or evolves, the malnutrition may worsen. Anorexia and cachexia are common causes of malnutrition among cancer patients. The absence of desire or hunger is known as anorexia. It is the most common root cause of malnutrition in cancer patients as well as a prevalent symptom. If the cancer develops or spreads, anorexia may appear sooner in the course of the illness or later. When they receive a cancer diagnosis, some people already suffer from anorexia. Most cancer patients with advanced stages will also have anorexia. The symptoms of cachexia include weakness, loss of body fat and muscle, and weight loss. It is often experienced by those with cancers that affect their ability to ingest and digest food. It is possible for cancer patients to eat healthily but not gain muscle or fat as a result of tumor growth. Cancers use specific nutrients in different ways. when we devour fat, protein, and carbohydrates can be changed by lesions located in the tummy gut, intestines, or the skull and neck area. Even if someone looks to be having enough, their body may be unable to absorb all of the nutrients that are present in their diet. Cachexia and anorexia may coexist in cancer patients (CAS), resulting in decreased lean body mass and weight loss. Better results might result from treating high-risk people to avoid this condition as opposed to treating those who have already been diagnosed with CAS.

**THE WAY OF CANCER DEVELOPMENT: -**

Since cancer is a hereditary illness, alterations to the genes that regulate the growth and division of our cells are the primary cause of the disease. Genetic changes that cause cancer can be caused by the following:

various mistakes that arise during cell division.

Hazardous substances found in the environment, such as chemicals in cigarette smoke and UV rays from the sun, can harm DNA.
Our parents left those to us.

Before they become cancerous, damaged DNA cells are usually destroyed by the body. But as we become older, our bodies' capacity to do so decreases. This is among the factors contributing to the increased risk of cancer in older adults. Everybody's cancer has a different collection of genetic changes. There will be further changes when the cancer gets worse. Different cells within the same tumor may show different genetic changes. When cells in the body experience aberrant genetic material alterations that result in unchecked growth and division, tumors are created. Numerous things, such as genetic mutations, prolonged inflammation, infections, and exposure to carcinogens (such tobacco smoke or UV light), can cause this. Benign or malignant tumors are both possible. Benign tumors usually grow slowly and remain localized at the place of genesis. They are not malignant. On the other hand, malignant tumors are carcinogenic and have the capacity to infect neighboring tissues before metastasizing—a process in which the tumor spreads to distant sections of the body through the lymphatic or circulatory systems. Numerous genetic and epigenetic alterations that result in unchecked cell growth and proliferation are known as carcinogenesis, and it is this process that gives rise to malignant cells. Numerous variables, including genetic predisposition, lifestyle choices (such as nutrition or smoking), environmental factors (such radiation or chemicals), and mutations, can result in these changes. These changes compound over time, giving the cells the ability to overcome typical regulatory systems and develop traits like unrestricted capacity for replication, resistance to cell death, and the capacity to infiltrate neighboring tissues and travel to far-off locations, all of which contribute to the eventual development of a malignant tumor.

Malignant cancer typically progresses through several stages:

Initiation: This stage involves the initial genetic or epigenetic changes that cause a normal cell to become cancerous. These changes often occur due to exposure to carcinogens or other factors that damage the cell DNA.

Promotion: During this stage, the mutated cells begin to proliferate and form a small cluster of abnormal cells. Factors such as inflammation and hormonal influences can promote the growth of these cells.

Progression: In this stage, the cancer cells acquire additional mutations that enhance their ability to proliferate and survive. Additionally, through a process known as metastasis, they might develop the capacity to infiltrate adjacent tissues and travel to far-off places.
Metastasis: The movement of cancer cells from the main tumor to other areas of the body through the lymphatic or circulatory systems. Cancer cells have the ability to spread to new locations and develop additional tumors, which can worsen the condition and make therapy more difficult (11).



**TYPES OF CANCER:-**

Cancer is a life-threatening disorder usually characterized by abnormal cell proliferation by alteration of gene sequences and form tumour and destroying cell in the end. Actually, in the first stage tumours are formed and types of cancer depends on the types of tumours. Tumour can be classified as different types these are as follows- First, classified depending on tissue organ and system. This type of tumour can be additionally categorized as-

MALIGNANCIES. A carcinoma first arises on the skin or tissue that covers the outermost layer of the body's organs and glands. Carcinomas frequently evolve into solid tumors. They constitute the most common type of cancer. Among the various forms of neoplasia include pulmonary, colon cancer., prostate gland, and breast cancers.

SARCOMAS. These tumors first arise in the connective tissue layers which help and link the body. Sarcomas can develop from bone, cartilage, joints, muscles, nerves, tendons, blood vessels, or lymph vessels.

LEUKEMIAS. It is a particular kind of blood cancer. starts due to the uncontrolled development and modification of healthy blood cells. Lesions can be classified into four main types: acute lymphocytic leukemia (ALL), persistent lymphocytic leukemia, myeloid leukemia that is acute, and chronic myeloid leukemia.

LYMPHOMAS. It is a form of cancer that develops in the lymphatic system. The interconnected system of capillary tubes and glands helps the body fight infection. Primary lymphomas include non-Hodgkin lymphoma and Hodgkin lymphoma.

Second, depending on WHO classification tumour can be graded as low grade of 1 with highly differentiate mechanism of cells to high grade of 3 where cellular differentiate mechanism is not clear.

Third, it is depended on the stages or the rate of spreading tumour. It is known as TNM system which signifies the diameter of the primary tumour (T), spreading rate of lymph nodes (N) and presence of distant metastases (M).

Cancer is a disease in which our body has faced many difficulties and many problems and there are some common symptoms. By detection and analysis those symptoms we can detect the occurrence of cancer in our body, those symptoms are-

 Fatigue

 Insomnia

 Poor appetite

 Mood swings

 Dry mouth

 Less efficient in activity

 Drowsiness

 Pain

 Anxiety and depression

Apart from these there are a specified type of tumour those imparts specific types of cancer which occurs in a particular area with particular symptoms. Depending on tsymptoms those all are listed in Table 1.

Table 1. Information on different types of cancer and their symptoms

|  |  |  |
| --- | --- | --- |
| **Name of the****cancer** | **Place of****occurrence** | **Symptoms** |
| Lymphoma | Lymphocytes | Night sweat, weight loss, fever, pruritisseverely, alcohol- inducible pain, stiff person syndrome, degeneration of cerebellum, otherneurological problems, bulkiness of stomachor small intestine due to the presence ofascites etc. |
| myeloma | Plasma cell of the bone marrow | Pain, constipation, fatigue, impairedcognitive dysfunction, peripheral neuropathy,gastrointestinal problem, tingling sensation infeet/ hands, anxiety, depression and otherpsychological problems, sleep disturbancesetc. |
| Brain cancer | Brain | Haemorrhage, oedema, obstruction ofcerebrospinal fluid, problems of vascularsystem, hypoxia, nausea, vomiting,papilledema, headache, neural hyperactivityetc. |
| Bone cancer  | Bone  | Skeletal problems like fracture of bone,problems of spinal cord, pain, anxiety, sleepproblems, fatigue, numbness and tinglingsensation, disability in movements etc. |
| Skin cancer | Skin  | Bleeding, pain, spasm, dyspnoea, anaemia,drowsiness, fatigue, anorexia, paralysis,bloating delirium etc. |
| Oral cancer | Oral cavity  | Presence of lumps, white spot, abscess,dysphagia, oral mucosal lesion etc. |
| Breast cancer | Breast  | Presence of lump, pain due to the lumps,redness or erythema, oedema presence on theskin of breast and nipple, problem in nippledischarge, different sized breast, noticeablevenous pattern in breast etc. |
| Thyroid cancer | Thyroid gland | Hot flushes, leg crumps, feeling chills, jointpain, muscle pain, fatigue, nausea, weightloss, dyspnoea, insomnia, tingling sensationin feet and hands etc. |
| Lung cancer  | Lung  | Pain, fatigue, dyspnoea, haemoptysis, cough,loss of appetite, dysphagia, constipation,peripheral neuropathy, alopecia etc. |
| Stomach cancer or gastric cancer | Stomach  | Dysphagia, gastro-intestinal bleeding,vomiting, presence of blood in vomit, weightloss, epigastric pain, ascites, abdominaldistension. |
| Liver cancer | Liver  | Less appetite, feeling full taking fewmeal, weight loss, enlargement of liver, pain intummy, yellowing of eye, skin and urine,enlargement of spleen, nausea and vomitingetc. |
| Appendix cancer | Appendix  | Abdominal pain, anorexia, fever, fatigue,presence of ascites, guarding, vomiting,gastroesophageal reflux, epigastricdiscomfort, indigestion, flatulence, dysuria,intestinal bleeding, rectal bleeding, diarrhea etc. |
| Pancreatic cancer | Pancreas  | Bloating, diarrhoea, dark urine, weight loss,constipation, heartburn itching, insomnia,fatigue, belching, jaundice, abdominal pain,pale stool etc. |
| Uterine cancer | Uterus  | Irregular menstruation, abnormal uterinebleeding, postmenopausal bleeding,menorrhagia, pelvic pain, confusion,headache, seizures, abnormalities in vaginaldischarge etc. |
| Ovarian cancer | Ovary  | Bloating, constipation, abdominal pain,urinary symptoms, back pain, increaseabdominal size, gynaecological problems,lack of appetite, frequent urination, nausea,vomiting, weight loss, menstrual irregulating,swelling of legs, bleeding with course etc. |
| Cervical cancer | Cervix  | Post-menopausal bleeding, post-corticalbleeding, abnormal vaginal discharge, weightloss, fatigue, dysuria, lower abdominal painetc. |
| Testicular cancer | testes | Acute pain in testes, dull ache in abdomen,solid extra testicular mass, firmness in testes,scrotal heaviness and swelling etc. |
| Prostate cancer | Prostate gland | Bone pain, spinal cord compression, urinarytract obstruction, anaemia, oedema, bonefracture, coagulation disorder etc. |
| Colon cancer | Colon  | Constipation, bloody stool, abdominal pain,bloating, nausea, vomiting, anorexia, malaise,distended abdomen, anaemia etc. |

(9)

**CANCER AND CHEMOTHERAPY**: -

Chemotherapy is one method of cancer treatment. Also known as "chemo," It is one of many cancer treatments that use medications to fight different kinds of cancer. Additional pharmaceutical interventions include of:
**Hormone therapy**: medications that stop some tumors from getting the hormones they need to spread.
Immunotherapy: Medication that boosts your body's defenses against cancer.

**Targeted therapy** refers to drugs that alter the way cancer cells proliferate and behave.

One-third of cases can be cured in earlier stages of diagnosis by local strategies like surgery and radiotherapy. In the remaining cases, the need for chemotherapy can be decided by micro metastasis-detecting tests. chemotherapy is used in different number of clinical settings depending on the need.

Most commonly there are mainly three settings which are-

1. **Primary chemotherapy** – This is administered to patients who are diagnosed with advanced-stage cancer and have no other alternative treatment.

2. **Neoadjuvant chemotherapy** – This is administered to patients who have the option of local strategies like surgery but it is less effective. Its purpose is to reduce the size of the primary tumor so that surgery can be more effective. This is done after the surgical process. This stops the cancer from spreading and gives a better survival.

3. **Adjuvant chemotherapy** – This is administered to patient’s post-surgery which aims to lower cancer occurrence and improve patient survival and the quality of life. in these cases, after the tumor is surgically removed, in advanced cases giving chemotherapy in the right amount at the right time can be curative in general.

4. **Palliative therapy:** Chemotherapy decreases tumors and relieves symptoms, but does not cure cancer.

 Nutritional status during chemotherapy: cancer and chemotherapy cause loss of appetite, nausea, and vomiting resulting in malnutrition among the patients. Patients with chemotherapy-induced taste disturbance have less energy and nutrient consumption resulting in weight loss. zinc deficiency is seen in taste disorders probably due to zinc-binding drugs that are being used during the treatment.

To solve these nutrition-related problems measures need to be made. Monitoring, detection, education, and referral can be very helpful to address and solve these issues.(4)

**Food and fluids during chemotherapy: -**

Diets that deviate from what is generally considered healthful are often required of people with cancer. The following are frequently found in a healthy diet:
Lots of vegetables, healthy grain breads, cereals, and fruits. Eat dairy products and lean protein in moderation. Sugar, alcohol, salt, and saturated/trans fats (found in meat, dairy, butter, fast food, and fried foods) in small amounts.

During therapy, patient may have good and terrible days in terms of what one can consume. Here are a few approaches to managing: - Consume enough of protein and calories. This helps to maintain the endurance and repair organs damaged by cancer treatment. Consume when feel most hungry. When patient feel good, he or she might want to eat a larger meal and Whenever their hunger is poor, they should have liquid meal replacements. If someone doesn't feel like they can eat a wide range of meals, that's okay. Eat anything that sounds good until they are able to handle more food, even if it is the same thing repeatedly. For additional nutrition, protein shakes are another option. Make sure to stay hydrated. On the days when the patient is unable to eat, it is even more crucial to drink lots of water. The body can better absorb the fluids it needs when it drinks a lot. A typical adult should consume 8 to 12 cups of liquid per day. If the patient has a water bottle close by, this may be simpler.

Avoid eating food that is difficult to wash off, including berries and grapes, raw fish or shellfish, like raw oysters and sushi, and raw nuts. expired beverages, spices, or food. Purchase food in bulk from containers instead. Avoid eating at salad bars, buffets, and self-serve eateries. Eat nothing that has mold on it, including perishable items that have been left out at room temperature for longer than two hours and moldy cheeses like blue and Roquefort. After more than three days in the refrigerator, don't eat the leftovers. Let fish, poultry, pork, or turkey thaw outside. Must Not Consume Remaining Rice or Rice Products(4)

The most frequent eating issues that arise with cancer therapy are nausea, mouth discomfort, sore throats, difficulty swallowing, vomiting, changes in taste or smell, constipation, diarrhea, dry mouth, lactose intolerance, and weight gain. A patient with this illness may have oats with milk, soy milk smoothie, whole milk and apple smoothie, lactose-free chocolate pudding, banana milk shake, apple prune sauce, and high-protein milk shake.

**CANCER CAUSING FOOD: -**

 The World Health Organization (WHO) says there is "persuasive information" that processed meat promotes cancer. It is recognized as a grade 1 carcinogen as well as has been linked to the colon and stomach cancer. Carcinogenic processed animal products include hot dogs, ham, sausages, corned beef, jerky, and canned or lunch meat. Red meat is classified as the second category and it is thought to be cytotoxic to human beings. The biggest relationship between red meat consumption and cancer is colon cancer, although there is also evidence of linkages to pancreatic and carcinoma of the prostate. Alcohol is classed as a group 1 cancer-causing agent, which indicates that there is convincing proof of cancer-causing potential in humans. Alcohol intake has been associated with oral cancer, esophagus, breasts, liver, stomach, and the colon. Salad is a traditional food preservation method, particularly for fish, that is widely utilized in Southeast Asia and China. Unfortunately, this preservation procedure generates carcinogenic byproducts, which can cause cancer in people. Both Chinese-style salted fish and processed meats are classified as group 1 carcinogens. Obesity is a key risk factor for many malignancies, and body fat is the cause of many of them. (1).

Research shows that eating cancer compounds also causes hormonal imbalances in your body. For example - red grilled meat (Running alters its composition and renders the meat hazardous to the body). farmed fish (edible, but they are raised in water with chemicals and pesticides, which are then absorbed into their scales and flesh), hydrogenated oils ( chemicals are added for unwanted odors) and to remove other additives), HFCS compounds or high fructose corn syrup - they basically have less nutritional value and are extremely harmful to the human immune system, because HFCS absorbs nutrients from food, which weakens the immune system. and makes our bodies susceptible to tumors and cancer. Sugar is not included on these lists since it has no direct link to cancer, although it does provide empty calories, which can lead to weight gain and possibly obesity. Obesity has been related to 13 different types of cancer, which is becoming more prevalent in a nation where the average American consumes 89 grams of added sugar per day, which is two to three times the recommended amount. According to Langlois, eliminating additional sugar from your diet is one of the simplest ways to slim down while also lowering your probability of cancer.

According to the National Cancer Institute, when livestock such as beef, chicken, or aquatic creatures is cooked or smoke over a hot open fire or pan at extremely high temperatures, the fat and fluids interact with the blazing flame and its hazardous compounds. then cooked into the beef products we consume. However, they are not persuaded that they cause cancer. In laboratory testing, they reveal DNA mutations that increase the risk of cancers. Even though the tobacco industry has attempted to conceal it, we know there are at least 70 cancer-causing chemicals as well as pesticides in tobacco smoke. Not only do smokers get sick, but others who breath secondhand smoke are also more likely to develop lethal malignancies. (2).

Grilled food or barbecue also causes cancer. Heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs) are produced when food is roasted and smoked. Prolonged grilling or frying at high temperatures increase the chance of malignancies. Both HCAs and PAHs are mutagenic, which means they produce changes in DNA which can increase the risk of cancer. HCAs are created when proteinaceous food, carbohydrates cooked at high temperatures. PAH chemicals can be found in many smoked foods, cigarette smoke, and automobile exhaust. Researchers discovered that a high intake of well-cooked, fried, or grilled meats is linked to an elevated risk of cancer in colon, pancreas, and prostate cancer. Other studies, however, have found no link to a higher risk of colonic or prostate cancer. (3).

Fish farming: The fish farming industry requires raising large numbers of fish, including salmon. They are frequently exposed to cancer-causing chemicals, including flame retardants, pesticides, herbicides, and polychlorinated biphenyls. If you want the health benefits of omega-3 fatty acids provided by salmon without the added bacteria, choose wild salmon. French fries and potato chips: These fast foods are high in salt, hydrogenated vegetable oil, trans fats, acrylamide and pesticides. These may increase the risk of high blood pressure, cancer and other diseases. Microwave popcorn: Microwave popcorn is at the centre of the global lung debate due to the drug in its bag and in the product. Oils and nuts can be genetically modified as long as they are not organic. Microwave popcorn contains perfluoro octanoic acid (PFOA), which may be carcinogenic. Breathing vapour made from dangerous chemicals can cause cancer.(7,8)

**ANTI CANCER DIET: -**

Simply changing one's lifestyle and food can manage cancers. Extra body weight, bad food habit such as excess simple sugar consumption and refined flour food increase chance of hyperglycemia, low fiber food red meat, and an imbalance of omega 3 and omega 6 fats raise the risk of cancer. High fiber food, whole fruits, few seeds like flax seed reduce the risk of acquiring cancer. Onion garlic cabbage cauliflower broccoli brussels sprouts provide solphorophane which may decrease the chance of this disease.

MEDITERRANEAN DIETS- Mediterranean foods contain a significant amount of anti-oxidants and anti-inflammatory elements, which help to inhibit cancer cell degeneration and growth. This explains the protective effects of the Mediterranean diet on cancer. When examining the link between various foods and cancer, the high concentration of phytonutrients found in olive oil, wine, and vegetables can be ascribed to the Mediterranean diet's preventative properties. Not only do these foods have anti-inflammatory and antioxidant qualities, but they are also full of nutrients that can stop cancer cells from growing and prevent cell membranes from spreading. (5)

KETOGENIC DIET- A ketogenic diet causes a physiological increase in the two primary circulating ketone bodies, beta-hydroxybutyrate and acetoacetate, over the reference range, which is generally 0.5 m mol/L for beta-hydroxybutyrate. This mimics the metabolic state of fasting. These diets are low-carb (&lt;50 g/day), high-fat, and sufficiently protein-rich (about 1.5 g/kg body weight). In cancer therapy, a high-fat, low-carb diet is given to control serum glucose level. Lowering blood glucose levels decrease insulin and insulin-like growth factor levels, both of which stimulate cancer cell proliferation. The mitochondria are the principal sites of fatty acid oxidation, and they require robust and well-integrated mitochondrial electron transport chain activity. It is thought that inefficient mitochondrial electron transport chain activity leads to greater steady-state concentrations of O2/H2O2. In order to make up for the excess H2O2, the mitochondria accelerate glucose metabolism. (6)

 CONCLUSION

Free radicals are scavenged by antioxidants, which also shield our bodies from damage caused by oxidative stress and stop cancer from growing. It is important to eat healthy during and after cancer treatment. Diets are planned and modified accordingly. Banana, rice, apple, toast, pasteurized milk and dairy foods, soft meat, proper boiled egg, clean and cooked fish, microbes free fruits vegetables, canned fruit juice, herbal tea, purified water all these are allowed for person with cancer. Maintain healthy weight and physical activity is important. So , good nutrition is first priority, patients should be introduced nutritional management as early as possible with proper counseling. Prevention, early detection, proper diagnosis, fast treatment and care all these are major factors to control or prevent cancer. (2)

Do’s and don’ts: -

* Quite smoking avoid tobacco.
* Limit alcohol consumption
* Avoid sedentary lifestyle do exercise 30 minutes every day.
* Maintain personal hygiene and avoid pollution , unhygienic food.
* Develop positive attitude, avoid over thinking.
* Improve sleep time ,avoid late night screen time.(10)

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