



Antioxidant As Prophylaxis For Cancer:

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THE GREATEST WEALTH IS THE HEALTH

CANCER A NON-COMMUNICABLE DISEASE:

The abnormal uncontrolled growth of cells which is left untreated can ultimately cause death. Malignant tumour can invade surrounding structures and spread to distant sites. In 2022 India estimated 1.46 million new cancer cases, with crude incidence rate of 100.4 per 100,000 individuals, and this is projected to increase by 12.8% by 2025. Estimated incidence of cancer cases in India, at 2020 the cases were 13,92,179, In 2021 the cases were increased that is 14,26,447 and in 2022 again it is increased to 14,61,427.

Cancer is a leading cause of mortality worldwide accounting for almost 13% of death in the world. Cancer is often perceived as a disease that strikes for no apparent reason. While scientists do not yet know all the reasons. Many of the causes of cancer have already been identified beside intrinsic factors such as hereditary diet and hormones etc. Scientific studies point that there are many intrinsic and extrinsic factors that contribute to cancer development. Anti-oxidants are present in our food components which provides preventive measures against Cancer and many other disease conditions. Antioxidants counteract the effects of free radicals and reduces the damage caused by oxidative stress. The excessive free radical formation and oxidative stress are the most common factors responsible for cancer like disease conditions. The only thing is to know about this type of food intake and a healthy life style. Now let us know about the antioxidants, free radicals, and oxidative damages.

ANTIOXIDANTS

Antioxidants are found in various food including fruits, vegetables, whole grains, pulses, nuts, and seeds etc. It can neutralize free radicals by giving up some of their own electron. Help and protect cells against daily damage. Interact and neutralize free radicals, preventing them from causing damage. Fight free radicals in your body. These molecules can cause damage to cells and have been linked to various health conditions including cancer, heart disease and premature ageing. Antioxidants help to protect the body against reducing the amount of oxidative stress.

TYPES OF ANTIOXIDANTS: It includes:

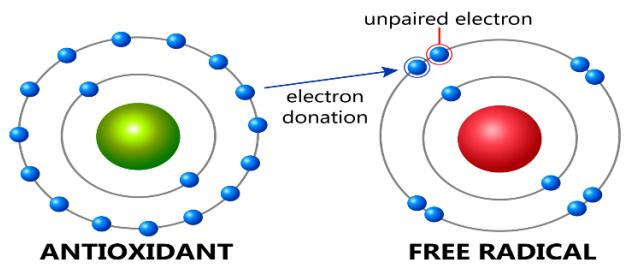
1. Endogenous antioxidants: It is of two types enzymatic and non-enzymatic. Enzymatic: catalyst, super oxide, dismutase, glutathione, peroxidase etc Non enzymatic: uric acid, glutathione etc

2. Exogenous antioxidants: Vitamin A, E, C, K, Carotenoids, beta carotene, lycopene, Polyphenols: flavonoid and phenolic acid. Minerals: Selenium, iron, zinc, magnesium etc.

FREE RADICALS AND OXIDATIVE STRESS:

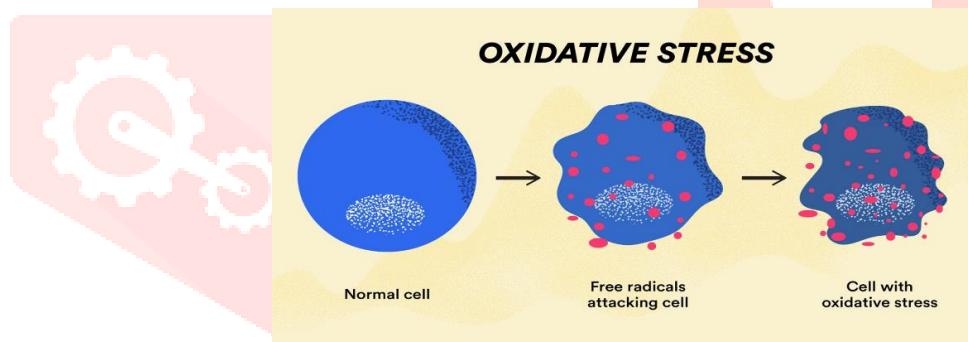
Free radicals and molecules with unpaired electron making them highly reactive and unstable. These free radicals are highly reactive, they can damage all the three important classes of biological molecules including nucleic acids, proteins, and lipids. They can damage cells protein and DNA potentially contributing to aging and diseases.

How antioxidants reduce free radicals



chemically reactive unpaired electron + electron donation: stable electron pair is formed, free radical is neutralised

Oxidative stress occurs when there is an imbalance between production of free radical and the body's ability to neutralise them with antioxidant. This imbalance can lead to cellular damage and dysfunction, even various health issues. Oxidative stress is linked to the conditions like cancer, heart disease, diabetes etc. Antioxidant found in food like fruits and vegetables whole grain foods help to neutralise free radicals and protect against oxidative stress.



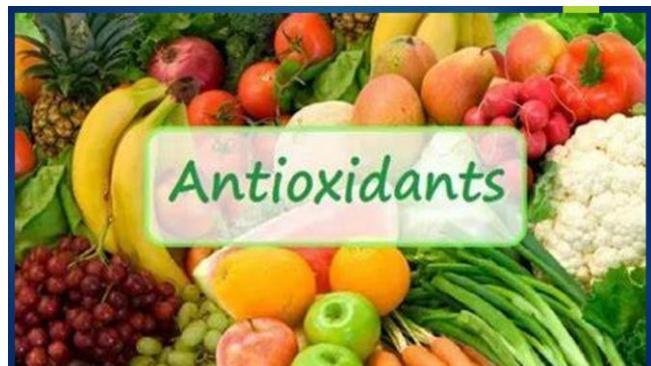
WHAT ARE ANTIOXIDANTS FOODS:

There are numerous choices for antioxidant rich foods. It includes fruits dry fruits, vegetables, spices, pulses, herbs, cereals, nuts and beverages like coffee, tea, fruit juices etc. Remember to eat variety of fruits and vegetables. Foods with darker, richer colour like orange yellow blue red tend to be higher in antioxidant and with all these choices you will never become bored because of nutritional options. Even they add variety and spice in life.

There are many different types of antioxidants including vitamins, minerals and plant-based compounds some common antioxidants include vitamin C found in fruits and vegetables such as oranges strawberries and spinach. vitamin E found in nuts and seeds as well as vegetable oil. Beta carotene found in orange and yellow fruits and vegetables such as carrots and sweet potatoes selenium a trace mineral found in nuts whole grains and seafood. Vitamin E, including tocotrienol and tocopherol, is fat soluble and protects lipids. Sources include wheat, nuts, seeds, whole grains, green leafy vegetables, kiwifruit, vegetable oil, and fish-liver oil etc. Melatonin- functions as a high-capacity antioxidant, or free radical scavenger, within mitochondria, playing a dual role in combating cellular oxidative stress.

Deeply pigmented fruits like cranberries, blueberries, plums, blackberries, raspberries, strawberries, blackcurrants, and other fruits like figs, cherries, guava, oranges, mango, grape juice and pomegranate juice also have significant polyphenol content. Polyphenols - Spices, herbs, and essential oils are rich in

polyphenols in the plant itself and shown with antioxidant potential. Flavonoids, a subset of polyphenol antioxidants, are present in many berries, as well as in coffee and tea. Antioxidants are important for maintaining good health and preventing disease.



ROLE OF ANTIOXIDANTS IN THE PREVENTION OF CANCER: A COMPREHENSIVE REVIEW:

Antioxidants, naturally occurring compounds found in various foods and supplements, have emerged as promising agents in cancer prevention. They play a significant role in neutralizing reactive oxygen species (ROS) and protect cells from oxidative damage. A well-balanced diet rich in fruits, vegetables, whole grains, nuts and seeds are the reliable source of antioxidants. Specific antioxidants, such as carotenoids, flavonoids, and polyphenols, are abundantly present in these dietary sources. Observational studies have consistently demonstrated an inverse relationship between antioxidant intake and the risk of various cancer types, including lung, breast, prostate, and colorectal cancer.

VITAMIN C AND CANCER PREVENTION: THE EPIDEMIOLOGIC EVIDENCE:

Epidemiologic evidence of a protective effect of vitamin C for non-hormone-dependent cancers is strong. Of the 46 such studies in which a dietary vitamin C index was calculated, 33 found statistically significant protection, with high intake conferring approximately a twofold protective effect compared with low intake. Of 29 additional studies that assessed fruit intake, 21 found significant protection. For cancers of the esophagus, larynx, oral cavity, and pancreas, evidence for a protective effect of vitamin C.

NATIONAL CANCER INSTITUTE: UNDERSTANDING THE CORRELATION BETWEEN MEAT, FAT AND LARGE CALORY CONSUMPTION AND COLON CANCER:

Studies suggest that differences in diet may also play a role in determining cancer risk. The influence of tobacco, alcohol, dietary components, fat consumption and large number of calories exhibit an increased cancer risk.

NATIONAL CANCER INSTITUTE UNDERSTANDING CANCER AND ANTIOXIDANTS:

Decrease the cancer risk, the most compelling evidence has been obtained for fruits and vegetables. Those consumption has been strongly correlated with the reduction of cancer risk. Although the exact chemical component of these foods that are responsible for the protective effects are Vitamin (A, C, E) Carotenoids (like beta carotene, lycopene), And Polyphenols (Flavonoid, Phenolic acid) Eating 3 to 5 servings of fruits and vegetables each day is recommended.

CONCLUSION:

Based on estimates of new cancer cases in 2024, 4.2 percent of all new cases will occur among the Adolescent and young adults.

Any boys and girls in developing countries enter adolescence as malnourished and improper dietary habit leading to many vulnerable diseases and early death.⁵ Antioxidants have proven themselves reliable weapons in the war against cancer. Promoting a comprehensive approach to cancer prevention. Healthy lifestyle is vital and regular screenings are essential. As our understanding of antioxidants will become more complex; aiding us as we continually try to prevent cancer.

To develop a food habit from younger is essential in shaping food choices later in life. For any person to remain healthy and to be away from disease .It is extremely important for the persons to develop a proper eating habit. It is only possible when the person has ability to control his diet. That protects him from many of the diseases. The market is full of food products such as pizza, burger, momos and different attractive snacks. These have great influence over the food habit of todays youngsters. Fruits, spinach, Garlic, carrot, whole wheat, brown rice, Butter, daily product, orange, lemon etc is the source of antioxidants, these types of food provide immunity, anti-ageing, prevention from diseases like cancer neurological condition cardiovascular conditions etc.

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