ejpmr, 2023, 10(6), 124-127

SJIF Impact Factor 6.222

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Review Article

ISSN 2394-3211

EJPMR

NUTRACEUTICALS AS ADJUVANT TREATMENT IN CHEMOTHERAPY FOR CANCER

Dr. Sonia*

Associate Professor, Dept of Swasthavritta & Yoga, S.D.M Institute of Ayurevda & Hospital, Bengaluru.

***Corresponding Author: Dr. Sonia**

Associate Professor, Dept of Swasthavritta & Yoga, S.D.M Institute of Ayurevda & Hospital, Bengaluru.

Article Received on 28/03/2023 **Article Revised on 17/04/2023** **Article Accepted on 07/05/2023**

ABSTRACT

Treatment of cancer in contemporary science includes chemotherapy, radiotherapy, and biologically based therapies each contribute unintended side effects compromising the maintenance of health and nutritional well-being. Among these complications are nausea and vomiting, changes in taste, pain with fatigue, and changes in bowel habits. As the course of therapy abates, some of these symptoms resolve while others persist, especially prolonged aversion to certain foods due to altered taste and changes in bowel habit. Altering a diet that includes consumption of beneficial phytochemicals can influence the balance and availability of dietary chemopreventive agents. Nutraceuticals can significantly raise natural killer cells function and tumor necrosis factor and thus aggressive combination of immuno-active nutraceuticals and it is very important for the patients undergoing chemotherapy because in that stage, requirement for antioxidant compounds increases. Thus, supplementation with micronutrients as adjuvant in cancer patients may prove to be helpful. Hence Nutraceuticals play an important role as adjuvant during and after chemotherapy.

KEYWORDS: Cancer, Nutraceuticals, Chemotherapy, Diet, Nutrients.

Today, Proliferation is being observed in neutraceutical industry due to health seeking consumer trend. Neutraceutical has evolved from health promoting to disease preventing supplements. Various herbs and their phytochemicals discussed in the present review can prove potent neutraceuticals as they are pharmacologically safe and provide advantages in terms of suppressing tumor progression, increasing the sensitivity of chemo- and radio- therapeutics, and alleviate the side effects of chemotherapy. The review has been devoted towards better understanding of potential of these nutraceuticals as combinational therapy in cancer treatments.

Although chemotherapy has significantly improved overall survival, patients experience a wide range of physical and psychological symptoms that impact their quality of life. Symptoms seldom occur in isolation. Chemotherapy-induced hair loss remains greatly feared, with a negative impact on the well-being of many cancer patients. Cancer- and chemotherapy-induced poor appetite is usually the result of taste changes, mouth sores, nausea and vomiting, increased satiety, medication side effects, pain, fatigue, depressed mood, and anxiety. The associated decline in nutritional intake is often associated with progressive weight loss in cancer cachexia. Mouth sores, associated pain, and poor nutrition can place immunocompromised patients at an increased risk for infection. Conversely, some of the patients may be suffering from chemotherapy-related fluid retention edema which may lead to significant weight gain during chemotherapy. Fatigue was the most upsetting and unmanageable symptom among frequently occurring side effects during treatment. Moreover, fatigue is a hidden source of other upsetting symptoms. It seems possible that chemotherapy-related fatigue was significantly more intense, incapacitating, distressing, or depressing. Fatigue, sleep disruption, pain, and depressed mood are positively interrelated and co-occur, exacerbating one another and decreasing the quality of life of a patient during chemotherapy. These multiple concurrent physical symptoms and psychological distress during chemotherapy are often very debilitating in nature, resulting in significant interference in daily life, consequently affecting patients' ability to receive prescribed treatments. The impact of these multiple symptoms on the patient can be collectively described as "symptom burden," a concept that includes the occurring of symptoms, the level of distress, and manageability of the symptom experienced. Therefore, symptom burden is a distinct concept in symptom experience that contributes to an understanding of patients' physiological and psychological functioning during the diagnosis and treatment of cancer.

Nutraceuticals, mostly phytochemicals derived from dietary or medicinal plants such as soya bean, garlic, ginger, tea as well as propolis, honey and others, may have chemopreventive activities, as already suggested by epidemiologic and animal model studies. Their ability to reduce cancer incidence in these studies is likely related to apoptosis. The potential of using nutraceuticals as chemo preventive reagents has prompted a surge of in-vitro studied on of their biological effects in cultured human cells. Chemoprevention is the use of small molecules, including dietary or herbal chemicals, to prevent cancers, as opposed to chemotherapeutics, where chemicals, mostly synthetic, are used to remove or alleviate cancer symptoms. The concept of chemoprevention, although prevalent in the East for thousands of years, has not gained scientific recognition in the West until recently. Large scale clinical studies have demonstrated the efficacy of using tamoxifen, raloxifene, both estrogen receptor antagonists, and fenretinide, a synthetic retinoid, in protecting women from breast cancer.[2]

Nutraceuticals in Ayurveda

Ayurveda considers diet as one among the three pillars of life the other two being sleep and controlled celibacy. Diet finds prime place and shows its significance. When adopted religiously diet acts as both food and medicine and is a panacea when not at all followed adverse reactions results.

Terms like -Nutraceuticals', 'Functional Foods', 'Wellness Foods',' Medicinal Foods',' Pharma Foods' are claiming a lot of attention today which has been very well described and highly appreciated.

Similarly such terms such as rasayana(that which nourishes all body tissues and prevents ageing), pathya(diet for specific condition)anna (a common term for all that's ingested), ahara drava dravya etc are being dealt in great detail in Sanskrit terminology in Ayurvedic treatises and are reputed as that which prevents degeneration and ailments, promotes health of all tissues and sense organs and preserves healthy status.

Food plays a decisive role in every person's life. It provides nutrition to not only the body but also to the mind and makes you what you are.

It is best understood in Ayurveda based on five fundamental elements –the earth, water, fire, air and space and same understanding of all living beings makes it easier and less complex to comprehend.

Food is understood based on division of tastes -which are 6, viz, based on taste it is sweet(madhura) sour (amla)salt (lavana)bitter (tikta) spicy (katu)astringent (kashaya).apart from the taste the qualities like guru,laghu etc are also determined to design recipes and determine individual dietary sanctions and restrictions.[3]

Ayurveda recommends consumption of all 6 tastes in daily diet in varied proportions to ensure prolonged immunity and better health. And consuming only one taste daily is best way to decrease immunity.[4]

Specific rules and regulations with regard to seasonal food, circadian variation, nourishment for children, puberty, menopause, aged, sick, after surgery, expectant ladies, lactating mothers so on is found.

Factors like individual health condition, habitual food habits, assimilation capacity ,age, special nutritional requirement, attitude etc. dictate the quantity and quality of food in the sick people. Family members of patients were educated to design food as per above requirements to ensure faster recovery of patients.

Ayurveda compendium devotes more space and emphasis to promote the concept of functional foods making one doubt if Ayurveda is more about preventive food science.

The American Cancer Society and the American Institute for Cancer Research offer recommendations for healthy diet.

Food to be taken

- Protein Foods
- Fruits and Vegetables
- Low Fat Dairy and Dairy Alternatives (cow, soy, almond, rice etc
- Whole Grains and Starchy Vegetables: oats, quinoa, barley, brown rice, popcorn, corn, potatoes, peas, winter squash, and 100% whole grain bread, pasta, cereal, and crackers.
- Nutritious Fats: olive oil, canola oil, nut butters (such as peanut butter or almond butter), avocado, nuts, and seeds.
- Beverages: water, tea, coffee (especially decaf), milk, and diluted juice.

Food to be limited

- Sugar-sweetened foods: sugar-sweetened beverages, cereals, granola bars, yogurts, candy, cookies, cakes
- White refined carbohydrates: white flour, white bread, white rice, white pasta
- Red meat and processed meat: beef, pork, lamb, luncheon meats, pepperoni, sausage, bacon, ham
- Trans fats: foods made with partially hydrogenated vegetable oils, commonly found in commercially prepared peanut butter, pastries, fried foods, boxed cake mix, margarine, and shortening. Read labels and look for partially hydrogenated vegetable oil in the ingredient list to be sure.
- Alcohol: beer, wine, liquor, wine coolers, mixed drinks, etc.

In addition, research shows that certain strategies can help directly decrease your risk for cancer. Included below are the AICR's Guidelines for Cancer Survivors.[5]

Recommendations to Reduce Your Cancer Risk

- Be as lean as possible without becoming underweight.
- Be physically active for at least 30 minutes every day.
- Avoid sugary drinks, and limit consumption of energy-dense foods (particularly processed foods high in added sugar, low in fiber or high in fat).
- Eat more of a variety of vegetables, fruits, whole grains and legumes such as beans.
- Limit consumption of red meats (such as beef, pork and lamb) and avoid processed meats.
- If consumed at all, limit alcoholic drinks to two for men and one for women a day.
- Limit consumption of salty foods and foods processed with salt (sodium).
- Do not rely on supplements to protect against cancer.
- And always remember - do not smoke or chew tobacco.

EAT TO BEAT CANCER

Fresh garlic, leeks, onions, spring onions, radishes - for example, garlic is known to contain a number of anti-cancer agents and is believed to help stop cancer spreading and blood supplies forming to new tumours.

Pulses - for thousands of years we have eaten broad beans, peas and pulses providing phytoestrogens (plant oestrogens that are far, far weaker than human oestrogens) to protect us especially against the spread of hormonally driven cancers.

Glycoproteins and polysaccharides - Four Nobel Prizes for medicine in the last dozen years have been won for discoveries on these natural compounds which help cells communicate -good for your immune system´s ability to see friends and foes. Foods include aloe vera, echinacea, turmeric, pectins (e.g. apples and pears), arabinogalactans (e.g. in oats, psyllium, coconut, tomatoes, carrots, brown rice).

Even red wine and mother´s milk contain these important protective factors that encourage better messaging between cells. In the US they are now called "Super carbs" or monosaccharides but are actually neither. Probably the best studied are Medicinal Mushrooms like Reishi, Maitake, Cordyceps which are beta-glucan polysaccharides. (see below).

Dark Red foods - like beetroot, dark plums, aubergines, red grapes, blueberries etc which provide anthocyanins, known to kill cancer cells, and/or polyphenols such as resveratrol and quercitin which both have anti-cancer effects.

Bright colours - for example, red and yellow peppers, peaches, apricots, watermelon, for carotenoids, known to restrict cancers like breast cancer.

Greens - Kale, spinach, broccoli, cabbage for vitamin K, phytoestrogens and indole 3 carbinol.

Sprouting seeds has sulphoraphanes, which have strong anti-cancer activity.

Nuts and seeds try a breakfast of a little organic muesli, boosted by organic pumpkin and sunflower seeds and crushed flaxseed/linseeds. Great for B vitamins like folic acid and biotin to help protect DNA, cellular oxygenation and detoxifying lignans.

Bitter food like watercress, gooseberries, cranberries, blackberries, wild strawberries. Or almonds, cashew nuts, millet, buckwheat and apricot kernels all of which contain fiber and a variety of natural compounds (yes, including B-17, which people like Dr Contreras at the Oasis of Hope calls ´nature´s chemotherapy´).

Notable additions- Green tea,olive oil, fennel, oregano, turmeric/curcumin to boost your immune system and kill yeasts.

Switch out of cows´ dairy - to a little goats´ cheese, soya and rice milk. Swap red meat for game and oily fish (although research shows eating oily fish comes second to taking a supplement of fish oils everyday).

Eat more mushrooms, apples, organic brown rice, Manuka Honey (grade 12) and onions. We could go on. There is research on everything from the benefits of quercitin against cancer to the ability of medicinal mushrooms to cut oestrogen and boost the immune system. It is all in The Rainbow Diet and how it can help you beat cancer. Importantly, avoid fried food or burning on the grill and eat more raw foods. Avoid beers and spirits, although the occasional red wine seems (from research, you understand!) to help Administration of antineoplastic agents oxidative stress (the production of free radicals and other reactive oxygen species (ROS) reduces the rate of cell proliferation during chemotherapy interfere with the cytotoxic effects of antineoplastic drugs Antioxidants detoxify ROS enhance the anticancer effects of chemotherapy.[6]

DISCUSSION

Administration of antineoplastic agents through food will lead to oxidative stress (the production of free radicals and other reactive oxygen species (ROS) which in turn reduces the rate of cell proliferation during chemotherapy and interfere with the cytotoxic effects of antineoplastic drugs which results in Antioxidants detoxify ROS and enhance the anticancer effects of chemotherapy.[7]

CONCLUSION

The potent neutraceuticals discussed in the review should be researched further for their potential use as they are pharmacologically safe and provide advantages in terms of suppressing tumor progression, increasing the

sensitivity of chemo- and radio- therapeutics, improving an organism's immune system function, and lessening the damage caused by chemo- and radio-therapeutics. The review should provide the knowledge of potent neutraceuticals from herbal medicines that are capable of enhancing the efficacy of and diminishing the side effects and complications caused by chemo- and radio-therapy when used as adjunct therapy in cancer treatment.

BIBLIOGRAPHY

1. Gapstur RL. Symptom burden: A concept analysis and implications for oncology nurses. Oncol Nurs Forum, 2007; 34: 673–80.
2. Ahmad Salami, Enayatollah Seydi, and Jalal Pourahmad, Use of Nutraceuticals for Prevention and Treatment of Cancer, Iran J Pharm Res, 2013 Summer; 12(3): 219–220.
3. Sushruta Samhita. Sutrasthana 46:525. In: Bhishgratna K.L, translator. Sushruta Samhita. Vol. 1. Chowkambha Sanskrit Series Office, Varanasi, India, 1963.
   Sharma P.V, Samhita Charaka. Charaka Samhita Sutrasthana 25:. 4th ed. 1-4. Chowkambha Sanskrit Series Office, Varanasi, India: Chowkambha Orientalia, 1981-1996.
4. https://www.aicr.org
   Yamini Bhusan Tripathi, Pratibha Tripathi, Bahram H Arjmandi, Nutraceuticals and cancer management, Frontiers in Bioscience, February 2005; 10(2): 1607-18.
5. angel nivya, Raja , Kumaravel , Salini sasidharan, and Seethapathy GS, Role of nutraceuticals in cancer, International Journal of Pharmacy and Pharmaceutical Sciences, 2012; 4(4).