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Holistic Approach in Management of Oral Cancer – A Review

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Abstract

Oral cancer is one of the most common causes of morbidity and mortality today. Up to 85% of patients experience weight loss or malnutrition and long-term psychological distress during the cancer therapy. Hence, the challenge not only lies in controlling the cancer cells, but also in reducing its side effects and improving the quality of life of patients and the overall rate of survival. This article aims at addressing the issues of fall out of cancer treatment, improving the quality of life, minimizing the psychological distress and achieving a better survival rate.

Keywords: *Oral cancer; Treatment; Nutrition; Stress management; Quality of life*

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Introduction

Cancer is one of the most leading causes of morbidity and mortality today, with more than 10 million new cases every year as well as an alarming death rate that accounts for more than 6 million deaths per year. [1] According to published literature, around 43% of cancer deaths were due to tobacco use, unhealthy diets, alcohol consumption, inactive lifestyles Infection and low-income. [2] Disadvantaged groups are generally more exposed to avoidable risk factors such as environmental carcinogens, alcohol, infectious agents, and tobacco. Cancer treatment has evolved over the last decades with better and more precise therapies available to keep a check on the cancer cells. Worldwide, encouraging research is being carried out to find a complete cure for this dreaded disease haunting mankind. The relevance of such a breakthrough becomes even more relevant in the present time due to a 3-4 fold rise in the incidence and prevalence of oral cancer.

Treatment of oral cancer is ideally a multidisciplinary approach involving the efforts of surgeons, radiation oncologists, chemotherapy oncologists, dental practitioners, nutritionists, psychologist and rehabilitation and restorative specialists. The actual curative treatment modalities are usually surgery and radiation, with added chemotherapy to decrease the possibility of metastasis and to sensitize the malignant cells to radiation. It's also preferred for those patients who have confirmed distant metastasis of the disease. Prognosis of oral cancer is poor with a five year survival rate of less than 50%. Local recurrences as well as lymph node metastasis occur in a significant number of the affected people while distant metastasis is often rare. [3] Surgery, radiation therapy, and chemotherapy are the designated treatments to stop the spread of cancer by killing the cancerous cells.

Unfortunately these modalities of treatment are like double edged sword. On one hand they are amicable in saving the life of individuals suffering from cancer, but on the other they have inherent and long lasting side effects. In the process of radiation therapy and chemotherapy, many of the body's healthy cells are also damaged or destroyed. Most of the scientific literature shows that weight loss drastically increases the mortality rate for most types of cancer, while also lowering the response to chemotherapy.Chemo and radiation therapy are sufficient biological stressors alone to induce malnutrition. [4]

There is also considerable evidence suggesting that cancer patients suffer from substantial and long-term psychological distress associated with different forms of cancer and its medical treatment. [1] Hence, the challenge not only lies in controlling the cancer cells, but also in reducing its side effects and improving the quality of life of patients and the overall rate of survival. This article aims at addressing the issues of fall out of cancer treatment, improving the quality of life, minimizing the psychological distress and achieving a better survival rate.

Methodology

An extensive literature search was performed to create a comprehensive narration in the management of oral cancer and its outcome. This was done by searching PubMed, and Google Scholar for the key terms: oral cancer, treatment, nutrition, natural compounds and yoga. Meditation.

Discussion

Benefits of Nutrition in Cancer Treatment

1. Avoiding malnutrition & Reducing the toxic effects of chemotherapy & radiation

40% or more of cancer patients actually die from malnutrition, not from the cancer. [5] Nutrition therapy is essential to arrest malnutrition. Adequately nourished patients experience lesser nausea, fatigue, immune- suppression, alopecia, and systemic toxicity compared to the patients on routine oncology programs. Antioxidants like lycopene, beta carotene, vitamin C, vitamin E, and selenium appear to enhance the effectiveness of chemo, radiation, and hyperthermia, while minimizing damage to the patient's normal cells, thus making therapy more of a "selective toxin." [6] An optimally-nourished cancer patient can better tolerate the rigors of cytotoxic therapy. Numerous studies have proved the efficacy of Nutritional counseling (NC) and oral nutritional supplements (ONS) in head and neck cancer patients receiving radiotherapy (RT) singly or in combination with or chemotherapy (CRT). [7-11] (Table-1)

Author	Number of patients	Cancer therapy	Results
Goncalves Diaz., *et al*. (2005) [7]	Group 1: 32 pts; adapted oral diet; Group 2: 16 pts; enteral nutrition via a NG tube (6x/day); Group 3: 16 pts; oral diet associated to ONS between meals (3×/day).	RT	All of the groups presented an increase in the ingestion of calories and proteins ($p < 0.001$).
Ravasco., *et al*. (2005) [8]	Group 1: 25 pts; NC with regular foods; Group 2: 25 pts; usual diet with ONS; Group 3: 25 pts; intake ad libitum	CRT	Reduction of anorexia, nausea/vomiting, xerostomia, and dysgeusia: Group 1: 90% of pts; Group 2: 67% of pts; Group 3: 51% of pts
Paccagnella., *et al*. (2010) [9]	Group 1: 33 pts; early nutritional intervention before they were submitted to CRT; Group 2: 33 pts; CRT alone	CRT	The percentage of patients who had radiotherapy breaks >5 days for toxicity was significantly lower in the early intervention group than in the standard practice group as well as the number of days of radiotherapy delayed for toxicity and the frequency of hospitalization.

Van den Berg, (2010) [10]	Group 1: 20 pts; individual dietary counseling; Group 2: 18 pts; standard dietary counseling	CRT	Early and intensive individualized dietary counseling by a dietitian produces clinically relevant effects in terms of decreasing weight loss and malnutrition compared with standard nutritional counseling.
Valentini., et al. (2012) [11]	21 pts with NC and ONS	CRT	Head and neck cancer receiving CRT, nutritional counseling combined with ONS was associated with relatively low CRT-related toxicity

Table 1: *Role of nutrition in head and neck cancer patients receiving radiotherapy or chemoradiotherapy.*

2. Bolster immune functions

The data linking nutrient intake to the quality and quantity of immune factors that fight cancer is available in abundance. Immune system enhanced by Vitamins: A, C, E, B-6, Minerals: Zn, Cr, Se, Amino acids: arg, gluta, Herbals: Astragalus Cats claw, Olive leaf extract Foods: yogurt, garlic, enzymes, green leafy, shark oil, colostrum, benefits cancer patients. [12]

Burdock Root (67.7%), Slippery Elm (5%) Sheep Sorrel (21.6%) Turkey Rhubarb Root (5%) - This herb shows promise for helping to slow down cell changes and stop cancer. & it has anti-tumor activity. [13] It contains vitamin A and selenium, which helps to eliminate free radicals. Essiac tea is most effective when brewed from the original herbs that have been organically grown. It can be combined with other anti-cancer treatments. [14]

3. Sugar feeds cancer

Tumors are primarily obligate glucose metabolizers, meaning "sugar feeders". About 20% of calories consumed are from refined sucrose, but patients often manifest poor glucose tolerance curves due to stress, obesity, low chromium and fiber intake, and sedentary lifestyles. Whole grains should be preferred to processed (refined) grains, sugars and the consumption of refined carbohydrates, including pastries, sweetened cereals, soft drinks, and sugars should be reduced. [15]

4. Anti-proliferative factors

Numerous nutritional factors affect the progress towards malignancy by reducing the unregulated growth of cancer cells. A few nutrients like selenium, vitamin K, vitamin E succinate and the fatty acid EPA (Eicosapentaenoic acid) alter the genetic expression of tumours. [16]

Essential Natural Compounds Having Anticancer Property Curcumin

This is a plant phenol widely used as a spice (curry) and food-coloring agent. In vivo and in vitro studies have demonstrated that it may prevent initiation of DNA damage and is involved in anti-promotion mechanisms such as apoptosis. [19] A number of animal studies have shown that curcumin is effective in inhibiting carcinogenesis in the skin, colon, stomach mammary gland and oral cavity. [17]

Gingerol

Gingerol is a natural polyphenol in Ginger. It can induce apoptic changes in cancer cells of oral cavity. [18]

Neem

Neem which contains Gallic acid, catechin, and epicatechin are phytochemicals related to oral cancer, which have a carcinogen detoxifying enzyme, glutathione. Catechin can inhibit the production of metalloproteases, reducing the invasion and migration and inducing the apoptosis of cancer cells. It has anti-inflammatory potential by suppressive activation of nuclear factor κ-b (NFκ-b), which induces the apoptosis of cancer cells. [19]

Mushrooms

Mushrooms such as shiitake, maitake, reishi, and some agaricus species fight against cancer and improve the immune system because of the presence of certain glucans and polysaccharide peptides (proteoglycans). [23] Purified bioactive compounds derived from medicinal mushrooms are a potentially new and important source of anticancer agents. Four mushroom samples exhibit excellent mutagenic and anticancer activity. [20]

Spirulina

The blue–green microalgae Spirulina, is used in daily diets of natives in Africa and America. Spirulina is the healthiest food containing antioxidants, phytonutrients, essential fatty acids, probiotics, and nutraceuticals. Spirulina is an excellent source of protein, beta-carotene, gamma linolenic acid, B-vitamins, minerals, chlorophyll, sulfolipids, glycolipids, superoxide dismutase, phycocyanin, and enzymes. It is cultivated, processed, and marketed globally for its wealthy dietary products and has been extensively used in health foods, pharmaceutical, and specialty feed sectors. Spirulina has got no side effects and is non-toxic in nature. The nutrients present in Spirulina boost the immune system and enhance the body's ability to generate new blood cells to prevent disease and cancer. [21]

Stress Management during cancer therapy (Psycho-oncology)

The word yoga is derived from the Sanskrit root Yuj, which means to join or to yoke. In philosophical terms, yoga refers to the union of the individual self with the universal self. Yoga as a way of life, including diet and lifestyle as well as yogasanas, pranayama, and meditation contributes to the prevention and long-term remission from cancer. Yoga can reverse epigenetic changes against chronic diseases. Yoga treatment may reduce the chances of carcinogenesis. Physical exercise has the ability to kill the emerging cancerous cells naturally. Also performing breathing exercises like pranayama and yoga postures, help individuals in dealing with cancer in a calm manner. Maintaining a healthy immune system is vital to fight the cancerous cells arising in the body, as stress weakens the immune system; yoga and meditation are recommended to alleviate stress. [22]

Sudarshan Kriya, Pranayama, and Yoga

Yoga, meditation and pranayama are centuries old, time tested practices; these are known to relax mind and energize the body. Recently, Sudarshan Kriya has been introduced by Sri Sri Ravi Shankar ji. The process is introduced to participants through a 22-24 hour structured program called as Art of Living (AOL) workshop, spread over 6 days. Sudarshan Kriya- rhythmic cyclical breathing of slow, medium and fast cycles is preceded by Ujjayi Pranayam - slow breathing 3 cycles per minute; it is a forced inspiration and expiration against airway resistance, Bhastrika Pranayama - rapid exhalation at 20-30 cycles per minute and brief 'Om' chanting. These processes are practiced while sitting with eyes closed and awareness focused on breath. Process ends with a ten minutes rest in a tranquil supine position. This can be followed by a 20-minute meditation. [23]

Sudarshan kriya and Pranayam, as highlighted above, induces relaxation, increases antioxidant defense and natural killer (NK) cells in the body. These observations would have important implications for cancer: as they would suggest that (i) Sudarshan kriya and Pranayam may have a preventive role against cancer (ii) Sudarshan kriya and Pranayam may be effective as a secondary preventive measure, after curative treatment of cancer and (iii) in metastatic cancer, Sudarshan kriya and Pranayam may delay progression of cancer, improves survival and quality of life. [24]

Meditation is art of doing nothing with eyes closed. One gets into the awareness of nothingness (emptiness) or infinite space. Several techniques are available to make one reach a meditative state. Meditation can play a useful role for cancer patients. It can relieve the stress and the physical and emotional pain. Meditation can be helpful to some people in dealing with side effects of treatment and in overcoming the sense of loss of control and to gain mastery over their lives. It may be most useful when treatments have ended and the person is attempting to return to normal activities as a survivor. It can also help the people to change lifestyle to promote health and reduce the risk of recurrence. [25]

Meditation has been used to great advantage in caring for terminally ill and dying patients in hospice settings and at home. This involves the use of meditation to relieve physical and emotional pain and suffering due to the disease. It is useful when integrated into a comprehensive palliative care approach, which includes, discussing death and dying and feeling of loss within the context the state and the thoughts that arise during meditation. Many dying patients also find that calmness and silence of meditation bring profound feeling of acceptance, wellbeing and inner peace. [26] Healthy persons at higher genetic risk of cancer also may be drawn to meditation to reduce environmental and life style risk factors and to control anxiety and stress. [27]

All these techniques can be helpful to patients with cancer. Their practice enhances the coping ability of patients. These measures change the hopeless and helpless attitude to the active fighting spirit. They reduce the stress associated with the diagnosis as well as treatment of cancer. By reducing the stress they may alter the treatment outcome. On account of the positive effect of meditation on NK cell cytotoxicity and consequent up regulation of immune system, meditation can lead to prevention as well as delayed progression of cancer. Various studies shows improvement in sleep quality, mood, stress, cancer –related distress & overall quality of life. [25-27] (Table-2)

Author	Study design	Yoga & meditation intervention	Result
Cohen., *et al*. (2004) [25]	RCT of 39 particpants (stage I – IV lymphoma) Tibetan yoga for cancer patients	Intervention consisted of 7 weekly sessions that included 3 components: controlled breathing & visualization; Mindfulness.	Significant improvements in overall sleep quality compared to controls, including falling asleep more quickly, sleeping longer, and using fewer sleep medications.
Cohen., *et al*. (2005) [26]	RCT of 38 participants were randomly assigned to either the intervention group. The sample included a mixed group of cancer survivors (primarily breast cancer survivors) who were a minimum of 3 months post treatment (mean = 56 months post diagnosis)	Weekly 75-minute classes, participants were taught modified versions of yoga postures that involved gentle stretching and strengthening exercises and finished with 15 minutes of relaxation in corpse pose	At post intervention, yoga group participants reported lower levels of total mood disturbance and stress and higher levels of global quality of life and pain than control group
Moadel., *et al*. (2004) [27]	Stage I–III breast cancer (n = 59), wait-list control group (n = 29).	The 12- week intervention consisted of weekly 90-minute yoga classes based on Hatha yoga that included gentle stretching, breathing exercises, and meditation/sitting relaxation.	The control group reported significant increase in symptoms related to the central nervous system (eg, headaches, numbness) And reported significant improvements in emotional well- being over the course of the study.

Table 2: *Effect of yoga & meditation intervention on cancer patients receiving chemotherapy & radiotherapy.*

Conclusion

The need of hour is to have a holistic approach in treating oral cancer. Adopting ayurvedic medicines (natural & organic compounds), nutritious diet, yoga and meditation & naturopathy to compliment the cancer treatment and thereby improving the quality of life of cancer affected individuals which will improve the rate of survival of patients.

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