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Phytomedicines for Lung Cancer

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Abstract: ***Cancer is characterized by proliferation of cells that have managed to evade to central endogenous control mechanisms. There are many types of cancer occurs in to human body, in which second most commonest cancer is lung cancer which often found in both male and female. Whereas, the cell of lung cancer have defects within the restrictive circuits that plays a main role in governing traditional cell proliferation and physiological state. Lungs are part of respiratory system which consists of respiratory organ cells and that have capability to grow, alter and stop behaving commonly. Moreover, either of the number of these cells can grow into a tumour or few of them can be healthy. Additionally, few of the tumour growing cells are created by a group of cancerous cells. There are mainly two types of lung cancer: 1. Non small cell lung cancer and 2. Small- cell lung cancer Practically, Treatments like, Surgery, Radiotherapy and Chemotherapy cause toxic effect to human body inclusive of hair loss, weight loss, vertigo, etc. Whereas, in the case of phytomedicine treatment reduces the toxicity to the natural level and does not cause any harmful effect to human body. For e.g. herbs, spices , phytochemicals such as, phloretin , Theaflavin, 6-shogaol, etc, are termed as beneficial supplements for the health of the lung cancer patient.***

Keywords: cancer, tumours, lung cancer, symptoms and treatment of lung cancer, phytomedicines, phytochemicals

1. Introduction

Cancer is the rapid and uncontrolled formation of abnormal cells in the body. Cancer is a major cause of death and disability across the word. According to research on cancer GLOBOCAN project 2012. The cancer burden will double in the next 20 years. i.e. by the year 2035 there will be more than 1.7 million new cases (Ferlay J. *et al*., 2013). The absolute number of cancer death will increase in the corresponding period (Mallath Mk., Taylor DG.,*et al*,. 2014,). In India, the epidemiology of cancer is complex. The lack of a national cancer registry, high mortality among patients less than 70 years, local factors like tobacco use, smoking, poor-hygienic conditions, infections, poverty and limited access to treatment for the patients, make Indian scenario distinct from the rest of the world. This is further compounded by the poor awareness among the patients leading to less frequent screening and late reporting to the healthcare professional during the advanced stage of the disease (Kumar YS., *et al*.,).

As cancer care involves a burden on the patients and society both, different options have been suggested to decrease the cost of cancer chemotherapy but simultaneously improve the outcome (Siddiqui M, Rajkumar SV. 2012, Kolodziej M, Hoverman JR, *et al.*, 2011). Inclusion of phytomedicine into the conventional therapy is one of the proposed methods. Phytomedicine is herbal-based traditional medical practice that uses various plant materials in modalities considered both preventive and therapeutic.

There are different types of cancer. On the basis of sex determination and Organs in the body. these are some of the examples of cancers: - lung cancer, skin cancer, breast cancer, prostate cancer, colon cancer, bladder cancer are some carcinomas, blood cancer, brain tumour, germ cell tumours, Embryonal tumour, vascular tumours.

Phytomedicines are the medicines which are herbal based traditional medical practice that uses various plant materials for the prevention of the diseases. The use of plant, part of plants, and the isolated phytochemicals for the prevention or treatment of the different types of health concerns. Some of the natural plants components that have been use in phytomedicines. Botanical or herbal medicines may combine several actions to support the body health. Botanical drugs are safe for most conditions. Phytomedicines involves selection of plant medicines to stimulate the body's own functions and immune system, and support to body to heal itself.

2. Lung Cancer

Lung cancer is that the second most typical cancer for each male and feminine, accounting for thirty first of all new cancers. The yankee cancer society estimates that in 2014, 224210 new cases of carcinoma are going to be diagnosed. They conjointly estimate that 159,260 individuals can die from carcinoma (Kotajima F et al., 2014).

Lung cancer cells have defects within the restrictive circuits that govern traditional cell proliferation and physiological state. The transformation from a traditional to malignant carcinoma composition is believed to arise in a very multistep fashion, through a series of genetic and epigenetic alterations, ultimately evolving into invasive cancer by organism growth (Nowell computer 1976, PassCarbone DP, et al., 2010).

Lung cancer may be a kind of a cancer that begins within the lungs. The lungs are the foremost vital a part of the system of respiratory. Respiratory organ cells do have capability to alter and might grow or stop behaving commonly. A number of these cells will grow into tumours that are non cancerous and a few can grow into tumours, that are created of a bunch of cancerous cells. These cells will have an effect on the encircled tissues and conjointly have an effect on the opposite a part of the body.

Types of Lung Cancer
Lung cancer is further divided into non small cell lung cancer and small cell lung cancer.

Non-small cell lung cancer
It constitutes concerning eightieth of the carcinoma square measure any classified into four types:

- Adenocarcinoma: It forms within the secretion manufacturing surface epithelial tissue and is that the most typical seen within the feminine and non-smokers.
- Bronchi alveolar carcinoma: this sort of cancer forms close to the air sacs of the lungs.
- Large cell carcinoma: It type near the outer edges or surface of the lungs. It's less common.
- Squamous cell carcinoma: It forms within the lining of the cartilaginous tube tubes. This is often related to smoking tobacco.

Small cell lung cancer
It is additionally called small cell malignant neoplastic disease, it's characterised by small cells that multiply and type giant tumours that unfold. This is often associate in nursing aggressive reasonably carcinoma that spreads fastly. It's usually seen in smokers.

Symptoms
Usually carcinoma doesn't cause signs and symptoms in earliest stages. Symptoms occurs only the illness in advanced.
If the carcinoma has unfolded, an individual could feel symptoms in different elements within the body. Carcinoma to unfold embrace different elements of the lungs, bodily fluid nodes, bones, brain, liver, and adrenal glands.

- Chest pain, rib pain
- Cough can be chronic, dry or with blood
- Frequent respiratory infection, shortness of breath
- Fatigue or loss of appetite
- Hoarseness, swollen lymph nodes, weakness or weight loss.

2.3 Treatment

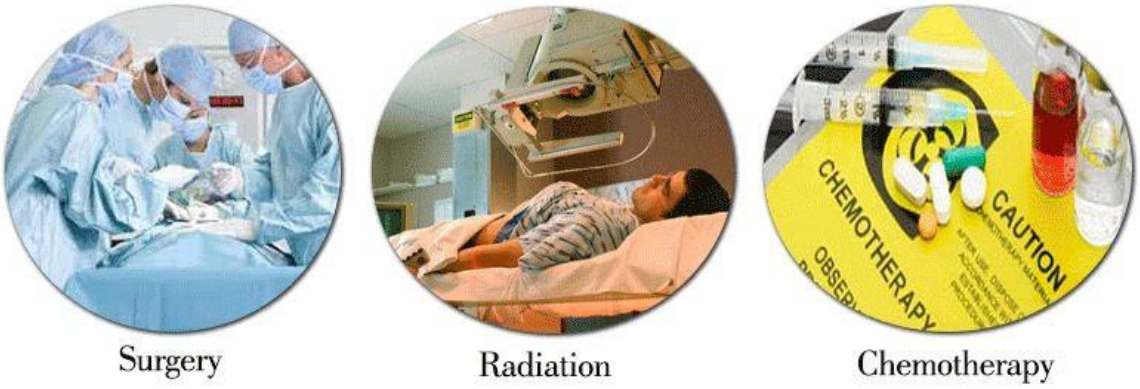

Figure 6: Treatment of Lung Cancer

A treatment of cancer is dependent on some factors of a patients like overall health, the kind of cancer, the stages of cancer. It conjointly depends on the whether or not it's carcinoma or small cell carcinoma. For the non small cell carcinoma the surgery isn't potential, to destroyed the cancerous cells actinotherapy are going to be used. In some cases chemo radiotherapy are also suggested. Small cell lung cancer is normally treated with the chemotherapy. Surgery isn't used for treatment for this type of cancer.

2.3.1. Surgery
Patients who have stage I, II, and IIIA NSCLC typically have surgery to remove the tumor if the tumor is found to be respectable and the patient is able to tolerate surgery. Surgeons may remove a lobe or section of the lung containing the tumour. To Currently, many surgeons utilize video-assisted thorascopic surgery (VATS), where a small incision is made in the chest and a thorascope is inserted. A lobe can be removed via the scope through this small incision so that a larger incision does not have to be made (Howington JA, Blum MG, Chang AC, et al., 2013).

There are four types of surgery

- Wedge resection: In Wedge resection a small section of lung is removed which contains tumor along with the margin of the healthy tissue.
- Segmentectomy: In Segmentectomy the larger portion of the lung is removed, but not the entire lobe.
- Lobectomy: In Lobectomy the lobe of the lung are removed. It's only possible when the cancer is just in one sector of one lung.
- Pneumonectomy: In the Pneuumonectomy the whole lung is removed. It is normally used when the cancer spread throughout the lung.

2.3.1.1. Test before surgery
1) An electrocardiogram [ECG]
2) spirometry

2.3.2. Radiotherapy
Radiotherapy is a common type of treatment that uses pulses or radiation to destroy cancer cells. It is used to control the symptoms and decrease the spread of cancer. It is used to cure non small cell lung cancer when the person isn't healthy for the surgery Radiotherapy uses high-energy beams to damage DNA within cancer cells, thereby destroying them. This therapy can help control or eliminate

tumors at specific sites in the body. Patients with NSCLC that is localized to the chest and who are not candidates for surgical resection may benefit from radiotherapy. Radiotherapy also can be part of palliative care to improve quality of life in NSCLC patients who do not respond to surgery or chemotherapy (Amini A, Yeh N, Gaspar LE, *et al.*, 2014).

2.3.3. Chemotherapy

There are number of different chemotherapies which can be used for the treatment of lung cancer. As chemotherapy is considered to be potent cancer cell killing medication for treating cancer.

1) Given before surgery which can shrink a tumour, and increase the chance of better surgery.
2) Chemotherapy are of two types
   a) Targeted: Particular part or mass of cell is targeted without affecting healthy cells.
   b) Non-targeted: A group of cells are targeted and it can affect nearby cell by destroying healthy cells.
3) It also combined with radiotherapy.

It is given in a certain periods. This treatment also given in a cycle.

The dose of the therapy is totally depends on the type or the stage of the lung cancer. Most of the persons need four to six dose of chemotherapy over the five to seven months.

Side effects

- Vomiting
- Hair loss
- Fatigue
- Mouth ulcers
- Body paining
- Nausea

3. Phytomedicines for the lung cancer

Phytomedicines are safe for use for many diseases and cancer is no exception. In phytomedicines there are certain spices, herbs, foods and some phytochemicals are used to beneficial for the health as lung cancer patients. Recent reports have shows that herbal medicines and their phytochemicals which seems to have lower or little toxicity provide an attractive strategy for the lung cancer therapy. Traditionally, herbal plant such as Platycodon grandiflorum (Campanulaceae), Morus alba (Moraceae), Prunus armeniaca (Rosaceae), Rhusverniciflua (Anacardiaceae), Perilla frutescens (Labiatae), Stemona japonica (Stemonaceae), Tussilago farfara (Compositae), and Drabanemorosa (Brassicaceae) have been used to treat lung cancer. Herbs are mainly used in lung cancer to reduce therapy associated toxicity and cancer related symptoms and sometimes to directly increase anticancer effects.

Some specific phytochemicals, that are felt to be responsible, and the different ways in which these substances may interact with cancer cells by hastening cancer cell death, inhibiting the ability of the cells to spread and other mechanisms.

1) Phloretin
   Pears contain a phytochemical called **phloretin** that is thought to have anti-tumor activities. Phloretin markedly induced programmed apoptosis in these non small cell lung cancer cells. anticancer effect of cisplatin, a common chemotherapy drug used for people with lung cancer. It may reduce fibrosis in the lungs.
2) 6-shogaol :
   Ginger may play bigger role for people living with lung cancer. It contains a compound **6-shogaol** that may help prevent the development of lung cancer. It was also found that dietary ginger intake reduce the risk of lung cancer.
3) Theaflavin :
   Green tea is another food to do double duty when it comes to lung cancer. compound including **theaflavin** and **epigallocatechin-3-gallate** were found to potentiate the effect of the chemotherapy drug cisplatin which is used to treat lung cancer.
4) Quercetin :
   Capers are the highest known sources of a compound called **quercetin**. Quercetin is a powerfull antioxidant which appears to have a role in inhibiting the growth of several cancers, especially cancers of lung, blood and salivary gland.
5) Delphinidin :
   Berries such as blueberries, raspberries, blackberries and cranberries are loaded with compounds known as **anthocyanidin**. One form of anthocyanidin known as delphinidin made a significant difference for mice inoculated with epidermal growth factor receptor mutated human lung cancer cell.
6) Resverratrol :
   Resveratrol, a compound in red wine, has received a lot of attention for good reason. Resveratrol not only appears to lower the risk of developing several cancers but work to help cancer treatments work better. With lung cancer, an intake of this nutrient may help to improve the effectiveness of the common chemotherapy medications such as Taxol (paclitaxel), Platinol (cisplatin), and Iressa (gefitinib). A snack of red grape juice, a few bits of dark chocolate, and a few blueberries are a lung cancer fighting diet.
7) Lycopene :
   Tomatoes, and specially tomato sauces, contain **lycopene**, a potent compound for both reducing the risk of cancer and fighting it. Lycopene works at several points in the progression of cancer. It may inhibit the growth of tumors, interfere with the process in which lung cancer cells divide, inhibit the spread of cancer, and assist in ridding the body of cancer cells through apoptosis.

4. Conclusion

This paper demonstrates the beneficial effects and treatments of phytomedicines to the lung cancer. The results facilitate in terminal that inclusion of phytomedicines in to the cancer therapy are efficient and can facilitate in decreasing the mortality and rising the standard of life time of patients. Phytomedicines inclusion may facilitate and modification the socio-economic burden of republic of India. This review shows that a lot of medicative herbs are

examined for anti lung cancer activity, presenting necessary results that give in sight in to their use for treatment of lung cancer. For these studies, they are classified solely as "active". Additionally, new analysis finding have shown extracts as potential phyto therapeutic adjuvents in advanced carcinoma medical care. This might cause bigger safety and advantages for individuals, contribute to higher access to help care and thereby a higher quality of life time a patients with carcinoma.

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