

*Review Article***HERBAL MEDICINE IN CANCER TREATMENT AND ITS ASSOCIATED THERAPY****ASHISH KUMAR PAREEK\*, DR.SHIV GARG, MANOJ KUMAR, SARDAR MAL YADAV**

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**Author for Correspondence:** pareekashishjpr@gmail.com**ABSTRACT**

Cancer is the leading cause of a number of death in India and many other countries. In all over the world about 20% of death are due to cancer. A large number of allopathic drugs are available for the treatment of the cancer but they are unable to treat cancer apart from this the allopathic drugs and chemotherapy used for the treatment of cancer provide a lot of side effects like nausea, vomiting, cancer pain, granulocytopenia, agranulocytosis, lymphocytopenia, oligozoospermia, carcinogenicity, hyperuricaemia, alopecia etc. These adverse effects affect the physical and mental health of the patient. All these adverse effect can be avoided by using herbal drugs. Herbal drugs are better alternative for the treatment of cancer and its associated adverse effect. Complementary and alternative medicines (CAM) are widely used for the treatment of cancer in China and Hongkong. Kombo medicines are most popular in Japan and they are also approved by Japanese government. It is concluded that herbal drugs in combination and in combination with chemotherapy would be a better approach for the cancer treatment. A lot of research are required on herbal drugs to take the advantages of herbal drugs. The following review covers all over the Herbal drugs and alternatives that have anti cancer activity and may provide a therapeutic role in various form of cancer.

**Key Words:** Chemotherapy, CAM, Kombo Medicine.**INTRODUCTION**

The current evaluation of cancer treatment is entirely based on Patient survival and tumor response. The main Aim of the medicines are to destroy tumor cell, so far the method chemotherapy, surgery, radiotherapy are used for cancer treatment. Removal of tumor is a difficult task, so these therapy may cause serious complications and decrease the survival<sup>1</sup>. A Large number of Complementary and Alternative Medicines are used for the Treatment of cancer. It is estimated that about 50% cancer patient receives herbal drug and Antioxidants for the treatment of cancer<sup>2</sup>. About 83% breast cancer patient use herbal medicine for the treatment of breast cancer. Herbal medicine use widely because they improves the Quality of life, extending the life span of Patient, and preventing the chances of recurrence<sup>3</sup>.

In USA there is more increase interest in clinical trials Based on herbal medicine in cancer chemotherapy<sup>4</sup>. In china the most of the population uses Chinese herbal medicines (CHM) for the treatment of cancer. Ginseng, Astragalus, Glycyrrhiza and Atractylodes increases the immunomodulatory effect and also has anticancer activity so they are most commonly used herbs for the treatment of cancer. Several herbs are used in combination to reduce the toxicity in cancer treatment<sup>5</sup>.

**Nanotechnology in the treatment of cancer by using herbal drugs**

Researcher found that herbal drugs are able to destroy the cancer cells without affecting the healthy cell of the human body. The nano herbal drugs are most effective against the lymphoma nano herbal drugs softened the tumor, reduces the tumor size and completely treated the tumor within 2 months. The stable drug loaded polymeric micelles provides enhanced permeability and retention effect of the drug. Researcher develops plant virus to deliver the drug into the cancer infected cells, these virus contain signal peptides that helps the virus to recognize the cancer cell. This method reduces the side effects of chemotherapy while increases the Effectiveness of the treatment<sup>6</sup>.

Liposomes entrapped with doxorubicin increases 300 times effectiveness of the drug due to increase pharmacokinetic parameter of the drug in Kaposi sarcoma. When paclitaxel is conjugated to a nanobead structure develops a nanoformulation known as Abraxane. Abraxane is one of the recent developed drug, approved for breast cancer. The nanobead structure improves the solubility, therapeutic index, and reduces the chances of toxicity<sup>7</sup>.

Table 1: Herbal Medicine used for the treatment of cancer.

Botanical name of the Plant with Family	Plant part used for anticancer activity	Chemical constituents	Mechanism of action	Uses
Catharanthus roseus (Apocynaceae)	Whole plant	Vincristine vinblastine	These drugs bind with microtubular protein tubulin and prevents polymerization cause disruption of mitotic spindle fibre and interfere cytoskeletal function.	Lymphomas, leukemias, breast cancer, testicular cancer, lung cancers, and Kaposi's sarcoma.
Podophyllum peltatum or P. emodii (Podophyllaceae)	Alcoholic extract of dried root	Podophyllotoxins etoposide and teniposide	Arrests cell in the G <sub>2</sub> Phase and inhibit DNA Synthesis by affecting Topoisomerase II	Skin cancers and warts. lymphomas and bronchial and testicular cancers
Taxus baccata (Taxaceae)	Bark extract	Paclitaxel Baccatins Docetaxel	Diterpin taxane which exerts cytotoxic action they increase the polymerization of tubulin protein but depolymerization is inhibited.	Breast, ovarian and non-small-cell lung cancer, and has also shown efficacy against Kaposi sarcoma.
Camptotheca acuminata (Nyssaceae)	Dried stem wood	Camptothecin Topotecan Irinotecan	They inhibit Topoisomerase I & inhibits DNA synthesis	Ovarian and small-cell lung cancers, while Irinotecan is used for the treatment of colorectal Cancer Glioblastoma, as well as cancers of the breast, lung and liver.
Garcinia hanburyi (Guttiferae)	Dried De-seeded fruits	Gambogic acid	Gambogic acid primarily binds with transferring receptor and induces apoptosis in various cancer cell.	Breast, lung, stomach and skin malignancies
Curcuma longa (Zingiberaceae)	root and rootstock, or rhizome	curcumin Phenolic constituents	Curcumin interferes with several important molecular pathways involved in cancer development, growth, and spread and it inhibits the production of nitrosamine that enhances natural antioxidant function in the body.	Prostate, colon, bladder and lung cancers
Silybum marianum (Asteraceae)	Dried ripe seeds	Silibinin Silymarin	Suppresses tumor cell proliferation by inhibiting G1/S-phase,	Leukemia and other cancer cells of breast, ovary, liver, lung, pancreas and colon
Artemisia annua (Compositae)	Unexpanded flower heads	Dihydroartemisinin (DHA) and artesunate	Cleavage of the Iron or heme mediated peroxide bridge that produce reactive oxygen species that directly destroy cancer cell.	Breast, lungs, stomach, colon and bladder tumor
Allium sativum (Liliaceae)	Bulbs of plant	alliin, alliinase, allicin	Garlic enhances the action of natural killer cell and macrophages, it also enhances activity of T-Suppressor cell.	Colon, liver, uterine, and breast cancers
Glycyrrhiza Glabra (Leguminosae)	Dried Unpeeled Root & Stolon	Glycyrrhizin glycyrrhetic acid	modulate the growth response of lymphocytes through augmentation of IL-2 production Inhibit tumor cell proliferation and induce apoptosis.	Breast cancer and colon cancer
Panax ginseng (Araliaceae)	Dried root	Ginsenosides, Panaxosides	Inhibit production of Tumor Necrosis Factor (TNF) and stimulate interferon level.	Breast cancer
Linum usitatissimum (Linaceae)	Dried ripe seeds	Lignan, 20 to 40% fixed oils	Lignan metabolites have a structural resemblance to estrogen receptor thus they bind with estrogen receptor and prevents the growth of estrogen mediated breast cancer.	Breast cancer and Lung cancer
Uncaria guianensis and U. tomentosa (Rubiaceae)	Root and stalk bark	Phyto chemicals glycosides, tannins, flavonoids, sterol fractions	Inhibits the production of Tumor Necrosis Factor alpha and increases production of macrophages.	Breast cancer
Hypericum Perforatum (Hypericaceae)	Dried Aerial Parts	Hypericin, Hyperforin	Inhibits serotonin reuptake and thus reduces cell growth, they inhibits Glioma cell lines.	Skin cancer
Zingiber Officinale (Zingiberaceae)	Dried scrapped or Unscrapped Root or Rhizome	Zingiberene, resin, Gingerol, Shogaols Volatile oils	suppression and arresting the G <sub>0</sub> /G <sub>1</sub> -phase, reducing DNA synthesis and inducing apoptosis <sup>8,9,10,11,12</sup>	Colon cancer

## **Cow urine or Gomutra in the treatment of cancer**

Persons who was suffering from cancer disease from last 4 years, leading a healthy life after the treatment with cow urine. Cow urine directly kills a number of bacteria and viruses that are responsible for several untreatable diseases like cancer, HIV, Diabetes and skin problems. Research is in progress for use of cow urine along with antibiotic to treat cancer that occur due to any viral and bacterial infection. Cow urine therapy is the most safer and cheaper technique for relieving patient from cancer<sup>13,14</sup>.

A number of properties are present in the cow urine responsible for anticancer activity.

### **Antioxidant property**

Volatile fatty acids are present in the cow urine which act as antioxidant. Antioxidants protects cell against the effect of free radical. Free radicals are produced due to exposure of tobacco, smoke and radiation. Free radical may damage cell and cause heart and cancer disease<sup>15</sup>.

### **Apoptosis**

It increases the self destruction ability of the cancer cell. Cow urine increases the apoptosis of lymphocyte that directly destroy abnormal growing cancer cell.

### **DNA repairing potential**

Distilled cow urine protects DNA and repairs it rapidly. This property reduces the spreading of cancer and helps to fight against cancer.

### **Antimicrobial activity**

Cow urine can kill a number of bacteria and viruses that develop resistance against cancer.

### **Bioenhancing property**

Cow urine act as a bioenhancer, due to this property cow urine increases the bioavailability and bioactivity of the anticancer drug.

### **Immounomodulating activity**

Cow urine enhances the potential of macrophages and lymphocytes. It increases both cellular and humoral immunity. Cow urine increases the immune system if taken on daily basis<sup>16</sup>.

## **Complementary and alternative medicine(CAM) in cancer treatment**

The use of complementary and alternative medicine is differ from country to country. About 80% of the total cancer patient believes treatment with the CAM. Different foreign country utilized CAM for the treatment of cancer. It is most popular in China, Hongkong and Taiwan etc. The quality of complementary and herbal medicines are according to international quality standard. The CAM therapy is utilized with the following objectives.

- To reduce the side effect of cancer pain during cancer treatment by applying acupuncture.
- To reduce the severe adverse effects during cancer chemotherapy.

- To avoid the unwanted interaction between the standard therapy and Herbal medicines.

Acupuncture and herbal medicine is the most common during CAM treatment. Acupuncture is used for reducing cancer pain and most effective in chemotherapy induced nausea and vomiting. Modern methods for cancer treatment is based on the identification of the herb with complete history and profile<sup>17</sup>. CAM treatment is basically adopted by the patient during chemotherapy. In CAM therapy a number of Herbs are used in combination with multiple herbs to increase the efficacy and reducing the toxicity of single herb<sup>18</sup>.

## **Kampo medicine treatment in Japan**

Kampo medicines are traditional Japany medicines obtained from different herbs and plant from the Japan. kampo basically originated from the China and adopted by Japan. Kampo medicines are more practically and simplified form of Chinese herbal medicine. Kampo medicine are used as supportive measure in Japan covered by national health insurance. Kampo medicines reduces the adverse effects of cancer treatment and improves the quality of life. More than 70% Japanese physician prescribed Kampo medicine for the treatment of cancer. They are better alternative to the conventional medicine. Ministry of Health, Labour and Welfare approved 148 kampo medicine for the cancer treatment<sup>19</sup>.

## **Homeopathy for cancer treatment**

Homeopathy is the alternative method of treatment, but most commonly it is not used for the treatment of cancer. The most common reason behind of the less popularity is that there is no evidence for the effectiveness of the homeopathy in cancer treatment. Homeopathy may be used for the treatment of cancer because it avoids the harmful effects of cancer and if proper research is to be carried out it may completely cure & treat the cancer. It is concluded that homeopathy may be used as supportive care for treatment of cancer<sup>20</sup>. Laboratory studies shows that homeopathic treatment reduces the size of the tumor, Induce apoptosis, and also induces protective and restorative effects<sup>21</sup>.

## **ALTERNATIVE THERAPY FOR CANCER TREATMENT**

### **Huma therapy**

In 1986 Dr. S M Atiq developed a herbal concoction for the treatment of cancer called HUMA. A number of herbs are used for developing Huma like Azadirachta indica, Curcuma longa, Embelica officinalis, Ocimum sanctum, Semecarpus anacardium, Tinospora cordifolia etc. It can be orally administered, well tolerated, with no adverse effects. In 1990 the central drug research Institute (Lucknow) describes that the dose used for the treatment of cancer in Huma therapy is quite safe. It was discovered that many cancer patient getting response from this herbal therapy and a profound effect was observed in patient suffering from rectal and oral carcinoma. Today the popularity of Huma is increasing with time.

The dose of the Huma therapy is decided on the basis of condition of the patient<sup>22</sup>.

### **Acupuncture therapy**

Acupuncture is most commonly used therapy for the treatment of adverse effect associated with chemotherapy. The national institute of health defined that the acupuncture "a family of procedures involving stimulation of anatomical locations on the skin by a variety of techniques". In Acupuncture therapy needles are stimulated electrically and manually. The effect of acupuncture therapy is based on stimulation followed by response to the central and peripheral nervous system. Acupuncture therapy is most popular in USA and China due to lesser in risk. The needle used in Acupuncture therapy are very small (30 to 36 gauge) and no cause pain on insertion. Acupuncture is most commonly used for the treatment of nausea, vomiting, pain, hot flushes, Dyspnea, secondary depression and Insomnia, smoking cessation, Leukopenia, fatigue, neuropathy etc. there are several unique advantages of Acupuncture therapy.

- Acupuncture is the single therapy used for controlling variety of symptoms and diseases, while the other available medicines and therapy are used for the treatment of single disorder and disease.
- Acupuncture therapy have low risk with less in cost in comparison to other medicine.
- Acupuncture therapy shows its importance against sham but caution should be required.
- The believe on acupuncture therapy of the patient is much more than any other therapy in controlling symptoms like nausea, vomiting, cancer pain etc.
- Acupuncture therapy can be used in combination for the treatment of severe cases of cancer<sup>23,24</sup>.

### **Refluxology in cancer treatment**

It was observed that treatment with Reflexology provide positive results. Reflexology reduces the feeling of stress, improved sleeping pattern, and increase energy level. In Reflexology pressure is applied on the specific point of feet. It is also known as powerful system of healthcare used for achieving and maintenance of the health, improves well being of the patient and removes the causes of illness and diseases. Reflexology works with the aim of following objectives.

- To maintain hoemostasis.
- Aid in Relaxation.
- Triggering the body own innate self healing capacity.

Reflexology works indirectly on the muscles through the message of the feet and assist the targeted muscle group in antispasmodic manner and helping in maintenance of relaxation<sup>25</sup>.

### **Pharmacopuncture therapy**

Pharmacopuncture therapy is entirely a new form of therapy derived from a combination of herbal medicine and Acupuncture. Herbal extracts are injected on the affected area to

produce therapeutic response. It can be derived by distillation process of various herbs including flavonoids. Flavanoids interfere in inflammation and carcinogenesis. Pharmacopuncture therapy reduces the size of the tumor. It is most effective in the treatment of skin cancer and Metastatic colorectal cancer<sup>26</sup>.

### **Naturopathy**

Naturopathy is entirely based on natural medicinal system. It is based on the principle that body will repair itself and recover from illness<sup>27</sup>.

### **Aromatherapy**

A number of essential oils derived from different plants are used in Aromatherapy. The whole plant and herbs are used for distillation process to obtain essential oils. Approximately 40 different essential oils derived from plants are used in Aromatherapy. Most commonly the oils are applied on the body topically in diluted form. Aromatherapy can be ingested through tea, by using in bath water and pillows. Essential oils improves the physical and mental well being of the cancer patient. In cancer patient aromatherapy reduce anxiety level, provide relaxation to reduce emotional stress, reduce cancer pain, muscular tension and fatigue. It is suggested that active ingredients from the essential oil entered in the body and may influence the brain and limbic system of the body. The scent receptors present in the nose send chemical messages via the olfactory nerve to the brain. This can affect emotional response, heart rate, blood pressure and breathing of the person. The main essential oils used in Aromatherapy are lemongrass, geranium, spearmint oils, eucalyptol, carvacrol and thymol<sup>28</sup>.

### **Gerson therapy**

It is developed by Dr.Max Gerson. The Gerson therapy is based on the capacity of the body to heal itself. Gerson therapy involves the use of nontoxic methods including organic foods, juicing, detoxification and supplements to activate the healing potential. Gerson therapy is a powerful natural treatment that enhances the immune system of the body and generate potential to fight the body against many symptoms that probably occurs due to cancer. Gerson therapy naturally reactivates magnificent ability of the body to heal itself - with no damaging side-effects<sup>29</sup>.

### **Future prospective**

It is concluded from the various studies that herbal drugs provide a good therapeutic response against the cancer and they play a major role in the side effects induced by cancer chemotherapy. Herbal drugs not have only the property to control the adverse effect rather than they also have property to treat a major type of tumors. Herbal drug in combination provide a dramatic role in treatment of cancer, But a lot of research will required to perform on the herbal drugs. It is the necessary requirement of the central and state government to provide the proper platform for research on the herbal drugs that provide a suitable action in treatment of major diseases,

approve the drugs that Passes all the necessary steps and clinical trials study required for treatment of cancer and increase the public awareness Programme that enhances the public interest towards the herbal medicine.

### CONFLICT OF INTEREST

The Authors declare no Conflict of Interest.

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