WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 12, Issue 1, 759-765. Review Article ISSN 2277– 7105

A REVIEW ARTICLE ON ROLE OF HERBAL MEDICINE IN TREATMENT OF CANCER

Dr. Md Wasiullah[1], Piyush Yadav*[2], Nitesh Maurya[3] and Vinay Kumar Deepak[4]

[1]Principal, Dept. Of Pharmacy, Prasad Institute of Technology, Jaunpur 222001 (U.P.), India.

[2]Principal, Dept. Of Pharmacy, Prasad Polytechnic Jaunpur 222001 (U.P.), India.

[3]Dept. Of Pharmacy, Prasad Institute of Technology, Jaunpur 222001 (U.P.), India.

[4]Assistant professor, Dept. Of Pharmacy, Prasad Institute of Technology, Jaunpur 222001 (U.P.), India.

Article Received on
10 Nov. 2022,

Revised on 01 Dec. 2022,
Accepted on 22 Dec. 2022

DOI: 10.20959/wjpr20231-26724

***Corresponding Author**
Piyush Yadav
Principal, Dept. Of Pharmacy, Prasad Polytechnic Jaunpur 222001 (U.P.), India.

ABSTRACT

Herbal medicines have a vital role in the prevention and treatment of cancer. A great deal of pharmaceutical research done in technologically advanced countries like USA, Germany, France, Japan and China has considerably improved quality of the herbal medicines used in the treatment of cancer. With advanced knowledge of molecular science and refinement in isolation & structure elucidation techniques, we are in a much better position to identify various anticancer herbs and develop the remedy that might cure cancer. The therapeutic effect of anticancer herbs is executed by inhibiting cancer-activating enzymes, stimulating DNA repair mechanism, promoting production of protective enzymes, inducing antioxidant action and by enhancing activity of the immune cells. herbal medicine is also used in nutrient supplement for anti-cancer and anti-inflammatory activity. Numerous in vitro studies of herbal medicine on different cell lines and in vivo study of herbal medicine have been reported. However, the mechanisms of actions remain unclear. This review aims to give an overview on the recentdevelopment of herbal medicine in the prevention and treatment of cancer. The report covers the possible mechanism of action of some of the herbal medicine. In addition, the common properties of herbal medicine are described. Finally, the study sheds lights on the pharmacological applications of herbal medicine in the treatment of cancer and its potential use as anti-cancer agents.

KEYWORD: Herbs, cancer, antimetabolites.

INTRODUCTION

Cancer is a term that is used to refer to a number of conditions where the body's cells begin to grow and reproduce in an uncontrollable way. This rapid growth of cancerous cells is known as a malignant tumour. These cells can then invade and destroy healthy tissue, including organs.[1,2] Cancer sometimes begins in one part of the body before spreading to other parts. This process is known as metastasis. Although more than 100 chemotherapy drugs (National Cancer Institution, http://www.cancer.gov/about-cancer/treatment/drugs) including alkylating agents antimetabolites, anti-tumor antibiotics, anthracyclines, topoisomerase inhibitors, mitotic inhibitors, corticosteroids, and othermolecularly -targeted agents are available for cancer chemotherapy (either alone or in combination), the overall long term clinical benefit from these agents has been generally disappointing, and modern chemotherapy usually ends in failure due to either severe side effects or loss of effectiveness. One major reason for the loss of effectiveness is the development of chemoresistance.[1–5] To overcome such problem, a new approach called precision medicine or personalized medicine has been proposed and initiated by the National Institutes of Health (Bethesda, MD, USA). While the precision medicine approach is likely to yield more effective cancer treatment options in the future, the drug development cost is not expected to be reduced and thus the new drug cost for the patients will likely ream of role in the treatment of cancer.

How common is cancer

Cancer is a common condition and is a serious health problem, both in the UK and across the world. It is estimated that 7.6 million people in the world died of cancer in 2007. In the UK, cancer is responsible for 126,000 deaths per year. One in four people die from cancer.

Herbal Medicine Treatment of Cancer

1) Podophyllum hexandrum

(Himalayan May Apple) contain podophyllin, which has similar therapeutic action on the dividing cancerous cells as that of the vinca alkaloids. Podophyllin arrests multiplication of cancerous cells by breaking down the microtubules into smaller subunits, thus inhibiting the cell division. Podophyllotoxin, an active principle of podophyllin, is used in the treatment of Hodgkin’s disease, non-Hodgkin’s lymphoma, leukaemia, bronchogenic carcinoma and cancers of the ovary & the testis.

2) Taxus brevifolia

(Pacific Yew Tree), **Taxus yunnanensis** (Yunnan Yew Tree), **Taxus baccata** (European Yew Tree) and **Taxus wallichiana** (Himalayan Yew Tree) contain taxanes, which include paclitaxel (Taxol) and docetaxel (Taxotere). Taxanes have a different mode of action on the cancerous cells than that of the podophyllin and the vinca alkaloids. Taxanes arrest multiplication of cancerous cells by cross-linking the microtubules, whereas vinca alkaloids and podophyllin act by breaking down the cytoskeletal organelle (microtubule) into smaller subunits. Taxanes are used to treat leukaemia and cancers of the breast, ovary, colon & the lung. Taxol was first isolated from bark of Taxus baccata by Indian born scientist, Mansukh Wani, and colleague Monroe Wall in 1992. Three mature Yew trees (60-100 years old) were consumed to extract one gram of Taxol. Later, in 1994, Taxol was synthesised successfully by two teams of American scientists, one headed by K. C. Nicalaou at the Scripps Research Institute, La Jolla, California and the other led by Robert Holton of Florida State University.

3) Allium sativum

(Garlic) has been used for thousands of years to treat various diseases. The earliest use of *Allium sativum* as a medicine has been recorded in ancient Egypt, Greece, India, China, Rome, Russia and Europe. Hippocrates was the first to recommend its use for cancer. *Allium sativum* contains more than 100 biologically useful secondary metabolites, which include alliin, alliinase, allicin, S-allyl-cysteine (SAC), diallyldisulphide (DADS), diallyltrisulphide (DATS) and methylallyltrisuphide. Garlic oil contains an amino acid known as alliin, which is converted to allicin when its bulbs are crushed. Allicin is a precursor to several sulphur-containing compounds that are responsible for the flavour, odour and pharmacological properties of *Allium sativum*. Recent studies revealed presence of bioflavonoids quercetin and cyanidin, which are responsible for antioxidant properties of garlic. Ajoene, a sulphur-containing compound, found in garlic oil, inhibits mutagenesis. Garlic oil prevents prostaglandin-dependent cancers by inhibiting lipoxygenase and cyclo-oxygenase enzymes.

4) Lagenaria sicararia

Lagenaria sicararia is a climbing factory that belongs to the Cucurbitaceae family.[44] It's believed to be indigenous to Africa and the first factory to be domesticated by humans.[44] It's now Extensively distributed nearly throughout the world. Still, it's substantially cultivated in the tropics and subtropics in a wide range of soil types and at variable mound below, 500m. The factory has been used for numerous purposes, primarily to give food, drug and mileage

objects.[44] In Ethiopia, L.sicararia is extensively set up around mortal agreement areas and it's Generally calledqil/kil.[28] It's reported to be used as a traditional medicinal factory for treating otitis media, internal illness and cancerous blisters.[28] To treat cancer, the leaves are crushed ands queezed onto the affected body part. Complying with this, there's scientific substantiation that alcohol excerpts and some triterpinoid composites insulated from the stems and fruits of L. sicararia parade significant cytotoxicity and anticancer conditioning against SK-HIP1 cell line and mortal bone melanoma cell.

5) Prunus Africana

Prunus africana is an evergreen tree within the Rosaceae family.[50] It's native to some regions of sub-Saharan Africa and Indian Ocean islets. The factory requires a wettish climate to flourish and it grows well in numerous corridor of Ethiopia, where it's generally known by the original tikur enchet. Traditionally, P. africana is used to treat a number of conditions, the major bones being respiratory diseases, bad breathe, diarrhea, gonorrhea, rabies in tykes, TB, injuries, observance problems and cancer. The root of the factory is preferred for treating cancer.

6) Cucumis prophetarum-

Cucumis prophetarum is a species of tendril- bearing condiment in the Cucurbitaceae family. It has similarly multicolored fruits that attract all children and creatures. It's extensively grown in Africa, Australia and Asia. It's generally known by the name yemdir embuay in Ethiopia, where it's frequently seen in ranges. Cucumis prophetarum (same rubric as cucumber) is used in traditional Ethiopian drug as a remedy for a number of conditions including coughing, rabies in tykes, stomach pain, to induce revocation, toothache, bad breath, diarrhea, eye conditions, gonorrhea, TB, and skin cancer. While different corridor of the factory are used for treating the different conditions, for skin cancer, pulverized roots made as pastes ointments are reported to be applied directly onto affected areas. Harmonious with the reported anticancer claim in Ethiopia, scientific studies have also demonstrated potent antineoplastic exertion for some composites insulated from the fruits of the factory. also, composites attained from the affiliated species, C. ficifolius (cucurbitacin D and E), have been set up to be antineoplastc agents.

7) Dodonea (V. angustifolia and D. viscosa)

Dodonacea angustifolia is an evergreen slender shrub belonging to the Sapindaceae family. It's generally set up in mite, in rocky soils or mountain. Although it's considered to be

nativeto Australia, it's extensively distributed throughout the tropics and subtropics. Growing in Ethiopia, it's generally known by its original name ketketa. It has a wide range of old and traditional remedial operations in Ethiopia, including treatment of multiple contagious and non-infectious complaint conditions, similar as snake bite, gastric diseases, and cancer on neck. Still, no information is available in the literature as to how the factory is used traditionally for cancer treatment nor is there scientific substantiation for its claimed anticancer exertion.

8) Euphorbia abyssinica

Euphorbia abyssinica is a succulent, waterless tree belonging to the family Euphorbiaceae(64). It's a factory that survives well in wettish montane timber, sticky woods and drop savannah, substantially in East Africa. In Ethiopia, it grows in dry, wettish and wet agroclimatic zones, generally above, 900m. Locally, it's extensively known by the name kulkuwal. Euphorbia abyssinica produces milky vesicant/ hazard latex which in part contributes to its traditionally claimed medicinal property. Although E.abyssinica finds some use as a old and traditional medicinal factory in Ethiopia and it's substantially used by the original population for live fencing, wood and timber.

CONCLUSION

The global script has shown a great increase in herbal drug exploration as anticancer remedy. Some of the exploration conditioning have been carried out on these shops during the once many decades which give sufficient provocation among the scientific community is exploring further information about these sacred shops. In malignancy of the below noted limitations on the reviewed papers, the present overview provides, for the first time, precious compendium of information on traditional medicinal Shops claimed to be used for cancer treatment. While utmost of the information presented is supported by colorful types of scientific substantiation, with apologies for farther disquisition, the rest of the information still awaits original evaluation. In short, the present work on purported anticancer medicinal shops can be a precious original source of information for overall understanding of the subject and for designing and conducting unborn exploration by relating areas of sins and formulating exploration approaches that need be pursued.

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