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HERBAL BASED INTERVENTIONS IN CANCER THERAPY

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ABSTRACT

Cancer is complex and multifactorial disease that continues to be a major health concern worldwide. In spite of significant advances in conventional cancer curatives, there is a growing interest in exploring volition and complementary approaches to cancer treatment. Herbal natural products have been used for centuries in traditional drug to prevent and treat various conditions, including cancer. This review highlights the eventuality of herbal natural products as anti-cancer agents, focusing on their bioactive composites. This review explores the use of various parts of herbal medicinal plants and their active phytoconstituents in the prevention and treatment of various types of cancer. A comprehensive survey of literature was conducted using the multiple databases to identify anticancer medicinal plants and their uses. Identified herbs exhibit therapeutic effects via mechanisms such as inhibition of cancer-promoting enzymes and hormones, activation of DNA form processes, reduction of free radical revolutionary conformation, and Improvement of the immune system. Medicinal plants are majorly contributed to inhibiting the progression of cancer. Herbal anti-cancer medicines offer therapeutic advantages, particularly selective toxicity against cancer cells, reducing the adverse side effects associated with conventional chemotherapy. Multiple studies and clinical trials are investigating their efficacity, safety and mechanisms of action on different of cancers such as lung, prostate and, breast carcinoma.

Keywords: *Cancer, medicinal plants, herbal drugs, therapy, phytoconstituent.*

INTRODUCTION

Cancer is a serious metabolic disease and remains a major cause of mortality despite advances in diagnostic tools, treatment and preventive measures [1]. Cancer is one of the leading causes of death and disease worldwide, with the number of cases steadily adding and expected to reach 21 million by 2030.9 [2]. Cancer research has always been a challenge due to its complexity. Different types of cancer can vary significantly in terms of genetic alterations,organs affected, prognostic and treatment approaches [3]. Herbal drugs have been used to treat various illnesses since ancient times. In countries like India and Greece, herbs have historically been employed as drugs, and many modern medicines have been derived from these natural sources.The earliest documented evidence of medicinal plant use dates back to around 2600 BC, recorded by the Sumerians and Akkadians [4]. According to the World Health Organization a large proportion of rural populations still depend on herbal plants as their primary form of healthcare. Conventional anticancer treatments (similar as chemotherapy and radiation) frequently veritably expensive, limiting their availability in low-resource settings. By dispensary, herbal remedies are more readily available and relatively inexpensive. Recent pharmaceutical exploration in developed countries (e.g., Japan, France, the USA, Germany, and China) has yielded high-quality natural product medicines for treating cancers. Certain herbs can protect the body from cancer by enhancing its detoxification functions.For illustration,the Mesothelioma chemotherapy medicine Taxol (paclitaxel) comes from the bark of the yew tree. However, taking a yew tree bark herbal supplement does not produce the same effects as Taxol [5].

1.TYPES OF CANCERL

1.1. Cancer of skin and lymphatic system
- a. Leukaemia
- b. lymphoma

1.2.Skin cancer
- a. Malignant melanoma

1.3.Cacers of digestive system
- a. Esophageal cancer
- b. pancreas cancer
- c. Colon and rectal cancer

1.4.Cancers in urinary system
- a. Testis cancer
- b. Prostate cancer

1.5.Cancers in women's
- a. Breast cancer
- b. Ovarian cancer

1.6.Misellananous cancer
- a. Brain cancer
- b. Bone cancer

2.TYPES OF CANCER TREATMENT

2.1. Chemotherapy

Chemotherapy works by killing or stopping the growth of cancer and cancer cells.

2. 2.Hormone Therapy

Hormone therapy is a treatment that slows or stops the growth of breast and prostate cancers that use hormones to grow.

2.3. Immunotherapy

Immunotherapy is a cancer treatment that helps your immune system fight against Cancer

2.4. Radiation Therapy

Radiation therapy as a type of cancer treatment that uses high boluses of radiation to kill cancer cells and tumours.

3. IMPORTANCE OF HERBAL MEDICINE

Herbal drugs play a major role as an adjunct or alternative in cancer care. Research suggests that certain herbs can help cancer cases manage with symptoms and the side effects of conventional treatments. Various plant-derived medications have shown anti-cancer properties in the laboratory (in vitro) experiments and animal models, although clinical evidence in humans is still emerging. For example, Astragalus (a traditional Chinese medicinal herb) has been reported to minimize the side effects of platinum-based chemotherapy drugs such as cisplatin and carboplatin [6-7]. Another herb, Dong Quai (Angelica sinensis), used in Traditional Chinese Medicine to promote overall health, may provide benefits to cancer patients receiving the chemotherapy drug doxorubicin (commonly used against solid tumour) Laboratory studies of burdock root (Arctium lappa) suggest it possesses anti inflammatory, antibacterial, hepatoprotective, and potential anti-cancer effects, although it has yet to be proven effective as a cancer treatment in humans. Turmeric (Curcuma longa), known for its anti-inflammatory compound curcumin, when combined with other natural agents like bromelain (from pineapple) and arnica, has been used to reduce postsurgical inflammation and bruising [8].

4.HERBAL MEDICINAL PLANTS

4.1.Vinca
- Plant name: Vinca
- Family: Apocynaceae
- Biological source: It is obtained from the dried entire plant of Catharanthus roseus linn
- Active constituents: Catharanthine, vindoline, vincristine, vinblastine.
- Parts used: Leaves, flowers
- Uses: Lung cancer, testicular cancer

4.2. Gingko
- Plant name: Gingko
- Family: Ginkgoaceae
- Biological source: It is obtained from the dried leaves of plant Ginkgo bioloba
- Active constituents: Bilobalide Terpenoids
- Parts used: Leaves
- Uses: Anticancer

4.3.Shisham
- Plant name: Shisham
- Family: Fabaceae
- Biological source: It is obtained from the plant Dalbergia sisso
- Active constituents: Dalbergenone
- Parts used: leaves
- Uses: Anticancer
- 4.4.Astragalus
- Plant name: Astragalus
- Family: Leguminous
- Biological source: Dried root of Astragalus membranacus
- Active constituents: Astragalositus, Flavonoids
- Parts used: Roots
- Uses: Lung cancer, Liver cancer

4.5.Red clover
- Plant name: Red clover
- Family: Fabaceae
- Biological source: It is a herbaceous species of flowering plant of Trifolium Pratense
- Active constituents: Coumarins, Saponins, Isoflavones
- Parts used: Bark
- Uses: Breast cancer

4.6.May apple
- Plant name: May apple
- Family: Berberidaceae
- Biological source: Mayapple's biological source is the rhizome and roots of Podophyllum peltatum
- Active constituents: Podophyllotoxin
- Parts used: Rhizome
- Uses: Lung cancer

4.7.Fenugreek
- Plant name: Fenugreek

- Family: Fabaceace
- Biological source: Fenugreek's biological source is Trigonella foenum-graecum
- Active constituents: berbamine, chelidonic acid, oxycanthine and palmatine
- Parts used: Seeds, leaves
- Uses: Hormone related cancer

5.DEVELOPMENT OF ANTICANCER PHYTOCHEMICALS VIA DIFFERENT APPROACHES

The potency of medicinal plants as therapeutic agents depends on the presence and attention of active phytochemical ingredients, which can vary with a plant's genetics as well as environmental factors (latitude, altitude, climate, season, plant age, etc.). Different parts of a plant may also vary in pharmacological activity and constituent levels. Although numerous bioactive phytochemicals have demonstrated anticancer properties in research, further advancement is demanded to restate these findings into viable treatments. The development of anticancer phytochemicals generally involves several approaches from natural products chemistry and pharmacology. One common strategy is guided seperation, where crude plant extracts (obtained from dried or fresh plant materials) are tested for biological activity, and also successionally fractionated using solvents of increasing polarity to isolate the active components [9,10]. Many analytical techniques like thin-layer chromatography, high-performance liquid chromatography, mass spectrometry, nuclear magnetic resonance spectroscopy, etc., are employed to separate and identify the bioactive composites. Use of applicable resins and matrices (such as Sephadex or silica gels) can aid in purifying phytochemicals. Certain reagents (e.g., vanillin sulfuric acid spray) help visualize and identify the classes of compounds during chromatography [11].

6. ADIMINISTRATION AND REGULATORY APPROVAL OF HERBAL ANTICANCER PLANTS

The path to clinical use for any anticancer agent including those deduced from herbs requires rigorous evaluation in clinical trials. Generally, new medicines must successfully pass Phase I (safety), Phase II (efficacy and dosing), and Phase III (comparative effectiveness) trials before entering regulatory approval for marketing. In principle, herbal medications intended as anticancer curatives are subject to the same standards. Regulatory agencies like the European Medicines Agency and the U.S. FDA generally require at least one well-controlled Phase III trial with statistically significant positive results to approve a new drug. In practice, still, pharmaceutical companies have sometimes accelerated the testing of new agents in humans, deviating from the standard protocol to expedite approvals. This can affect in drugs being submitted for approval with deficient data on efficacy, safety, or quality.

7.CHALLENGES

Despite their promise, herbal drugs face several limitations and challenges in the environment of cancer therapy. First, given their massive global use, it is imperative to include herbal products in pharmacovigilance programs. With numerous people exposed to herbal remedies, identifying the potential risks associated with their use is critical. Ensuring the safety of these products has become a major public health concern [12]. In recent times, there has been an increase in reported poisoning and adverse events related to herbal drugs use worldwide, underscoring the need for rigorous toxicity evaluations and active safety monitoring of herbal products to promote their safe use [13]. Regulatory oversight of herbal drugs varies extensively across the world and is frequently fraught with difficulties. Many countries struggle with challenges such as ambiguous regulatory status of herbals, inconsistent evaluation of safety and efficacy, lack of quality control, and limited expertise on herbal drugs within national drug regulatory authorities.The criteria and protocols for assessing the safety and effectiveness of herbal medicines are more complex than those for conventional pharmaceuticals.

8.FUTURE DIRECTIONS

Also, integrating herbal anti-cancer agents into clinical practice faces regulatory and acceptance walls. Herbal medicines frequently in a grey area between conventional pharmaceuticals and dietary supplements, leading to regulatory challenges that can hinder their clinical adoption. Rigorous clinical trials are necessary to validate the efficacity and safety of these agents, yet funding and conducting such trials can be complex and resource-intensive. Additionally, the medical community's acceptance of herbal treatments requires a shift in perspective, supported by robust scientific evidence and clear clinical guidelines [14]. Looking ahead, multidisciplinary collaboration will be essential to address these challenges and advance the field of herbal anti-cancer therapy. Experimenters, clinicians, and regulatory bodies must work together to standardize herbal extracts, develop innovative delivery systems, and conduct comprehensive clinical trials. The future of cancer treatment could be significantly enhanced by integrating herbal anti-cancer agents, offering a more holistic, effective, and patient- friendly approach.

9.CONCLUSION

From the present review, it can be concluded that herbal medicinal plants and their derivatives are active against many type of cancers like tuberclers, breast, ovarian, lung, liver, stomach, prostate and testicular cancers. In conclusion this review article provides the knowledge about anticancer medicinal plants of foreign origin, which are used by people all over the world.

Plant-derived phytochemical ingredients represent a promising area of exploration for innovative future therapies. Given the tremendous global incidence of malignancies and the high cost of conventional treatments, it is imperative to discover new, safe, and affordable anticancer agents as choices or supplements to current therapy. Phytochemicals offer a new approach for cancer treatment that is both environmentally sustainable and biocompatible. As talked over in this review, various natural herbs and their phytoconstituents show potential to combat various types of cancer.

10. AUTHOR CONTRIBUTIONS

All authours are contributed equally.

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12.DECLARATION OF COMPETING INTEREST

The authors have no conflicts of interest to declare.

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14.REFERENCES

1. He L, Gu J, Lim LY, Yuan ZX, Mo J. Nanomedicine-mediated therapies to target breast cancer stem cells. Front Pharmacol. 2016;7:313. doi:10.3389/fphar.2016.00313.
2. Kiranmai M, Renuka P, Brahmaiah B, Chandu BR. Vitamin D as a promising anticancer agent. Int J Res Pharm Chem**.** Available from: https://www.ijrpc.com/files/12-2108.pdf
3. Huang B, Zhang Y. Teaching an old dog new tricks: Drug discovery by repositioning natural products and their derivatives. Drug Discov Today. 2022;27(7):1936-1944. doi:10.1016/j.drudis.2022.02.007.
4. Nandipati MC, Sumalatha G, Baburao C, Babu JR, Sridevi C. Antitumor activity of *Mimosa rubicaulis* Lam. against Ehrlich ascites carcinoma in Swiss albino mice. Int J Pharm Sci Res. 2014;5(4):1514.
5. Rani TT, Brahmaiah B, Revathi B, Nama S, Baburao C. Targeting of anti-cancer drugs through nanoparticles. World J Pharm Pharm Sci. 2017. doi:10.20959/WJPPS20177-9441.
6. Singh A, Jha SK, Dwivedi PC, Srivastava U, Pal A. Revolutionizing healthcare: Integrating electronics, AI, traditional, and conventional methods. World J Adv Res Rev. 2024;23:2426-2434. doi:10.30574/wjarr.2024.23.3.2919.
7. Shamim, Ali S, Ali T, Sharma H, Kishor BN, Jha SK. Recent advances in monodisperse gold nanoparticle delivery, synthesis, and emerging applications in cancer therapy. Plasmonics. 2025;20(9):7121-7141.
8. Patel S, Singh S, Gupta AK, Dalimbe AY, Muthoju SM, Pawar AR, Jha SK, Gupta AJ. Ayurveda and common Indian spices: A natural alternative for cancer therapy. **Ayush** J Integr Oncol. 2025;2(2):91-102. doi:10.4103/ajio.ajio_20_25.
9. Savoca MR, Arcury TA, Leng X, Chen H, Bell RA, Anderson AM, Kohrman T, Frazier RJ, Gilbert GH, Quandt SA. Severe tooth loss in older adults as a key indicator of compromised dietary quality. Public Health Nutr. 2010;13(4):466-474. doi:10.1017/S1368980009991236.
10. Kirtonia A, Sethi G, Garg M. The multifaceted role of reactive oxygen species in tumorigenesis. Cell Mol Life Sci. 2020;77(22):4459-4483. doi:10.1007/s00018-020-03536-5.
11. Singh NK, Sengar AS, Jha SK. A review of Ayurvedic measures for preventing COVID-19 and promoting health during pregnancy. **J** Indian Syst Med. 2024;12(2):61-65. doi:10.4103/jism.jism_81_23.
12. Lamson DW, Brignall MS. Antioxidants in cancer therapy: Their actions and interactions with oncologic therapies. Altern Med Rev. 1999;4(5):304-329.
13. World Health Organization. WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems**.** Geneva: World Health Organization; 2004.
14. Han Y, Wang H, Xu W, Cao B, Han L, Jia L, Xu Y, Zhang Q, Wang X, Zhang G, et al. Chinese herbal medicine as maintenance therapy for improving the quality of life for advanced non-small cell lung cancer patients. Complement Ther Med. 2016;24:81-89. doi:10.1016/j.ctim.2015.12.008.