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Cancer Fighting Herbs

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Abstract:

Cancer is the leading cause of death around the world. Different types of cancer have different causes. The etiological factor include sex, geographical location, age with the other factors such as UV radiation, occupational exposure to carcinogen and mutagens, bacterial/viral infections and genetic succeptibility. The various methods for treating cancer have various side effects which affects the quality of life in the cancer patients. An anti-cancer agent could be effective at any of the classically defined stages of carcinogenesis initiation, promotion and progression. These agents are found in fruits, vegetables and herbs etc., Consumption of fruits and vegetables helps in the prevention of cancer. Cruciferous vegetables, allium vegetables, citrus fruits are some of the agents which prevent cancer. The extracts of various herbs are used as anti-cancer agents. Some of them are curcumin, honokiol, tripotolide, kanglaite.

Keywords: Cancer, Herbs, Honokiol, Cucumin

1. INTRODUCION:

Cancer remains as one of the major causes of death throughout the world [1].In cancer, cells grow and divide in an uncontrollable manner. Cancer may spread to other parts of the body. There are many factors which lead to cancer. Lifestyle factors such as abnormal dietary habits, smoking, alcohol consumption, physical activity can cause cancer [2, 3].Other factors include solar radiations, occupational exposure to carcinogens, automobile pollutants [4,5]. There are many types of cancers. Some of them are breast cancer, brain cancer, leukaemia, testicular cancer, oral cancer etc. Cancer can be detected by a number of ways including signs and symptoms, performing various tests. Chemotherapy is the treatment of choice used for cancer [6].Research is being done on anticancer agents in many countries [7].Many herbs have been used for the treatment of this disease [8]. Herbs are plants used for medicinal purposes [9, 10].Studies have shown the presence of chemo preventive agents in daily consumed plan based diet, they are phytochemicals, phenolics(tannins, lignans,flavonoids), carotenoids, glucosinolates.[11,12].These agents are found in fruits, vegetables, herbal extracts and beverages such as tea, coffee [13, 14]. These phytochemicals fulfil the requirements of a chemo preventive agent, such as selective toxicity, efficacy against most type of cancers [15].Honokiol is one of the bioactive constituent of Magnolia officinalis. Honokiol inhibits the proliferation of cancer cells [16, 17].It has anti-cancer activity against colorectal cancer in humans [18].Curcumin is derived from Curcuma longa linn.[19]. It suppresses the proliferation of cancer cells and to induce apoptosis [20, 21, 22]. Artemisinin and its derivatives (ARTs) such as dihydroartemisinin (DHA) and artesunate exhibit anti-cancer activities in vitro and in vivo. The anti-cancer activity of ARTs is seen in various cancers cells like as those in leukaemia, cancer cells of ovary, breast, liver, lung [23,24].

2. VARIOUS TYPES OF HERBS;

2.1. HONOKIOL;

Honokiol, one of the bioactive constituents of *Magnolia officinalis*, has attracted a great deal of research interest due to its diverse biological effects [25]. The root and stem bark of the oriental herb *Magnolia officinalis* (also known as Houpo) have been used in traditional Chinese and Japanese medicine for the treatment of various ailments due to its muscle relaxant, anti–gastric ulcer, anti allergic, antibacterial, and antithrombotic properties [26]. Studies have shown the benefits of honokiol herb against human prostate cancer cells in culture and *in vivo*. It has been shown that the exposure of human prostate cancer cells (PC-3, LNCaP, and C4-2) to honokiol resulted in apoptotic DNA fragmentation in a concentration- and time-dependent manner irrespective of their androgen responsiveness or p53 status.[27]. Other studies have revealed that honokiol can suppress proliferation of cancer cells in culture [28]. , Honokiol was shown to inhibit tumour necrosis factor-α–stimulated nuclear factor-κB (NF-κB) activation in cancer cells [29] . Honokiol treatment potentiated apoptosis, suppressed osteoclastogenesis, and inhibited invasion through inhibition of NF-κB activation [30]. Honokiol treatment caused apoptotic cell death in the CH27 human squamous lung cancer cell line in association with down-regulation of Bcl-xL protein expression, release of cytochrome *c* from mitochondria to the cytosol, and activation of caspases [31]. Honokiol exhibited potent anti proliferative and anti angiogenic activities against transformed angiosarcoma cell line SVR [32]. Recent studies have shown the investigation done to know whether honokiol could overcome the apoptotic resistance inherent in B-Cell chronic lymphocytic leukaemia. The study has shown that honokiol acts directly on B-CLL cells to induce cytotoxicity in a manner that causes caspase-dependent apoptosis within 16 hours. An important observation of the study is that honokiol, perhaps by lowering the apoptotic threshold, enhances the cytotoxic effects of other chemotherapeutic agents commonly used in the treatment of B-CLL. This reduced viability was evident when honokiol was used in combination with nucleoside analogs or with chlorambucil. This suggests that the combining of a low dose of honokiol with other anticancer drugs may be a potential therapeutic strategy. Given its ability to overcome apoptotic resistance, honokiol may also be effective in other hematopoietic malignancies [33].

2.2, CURCUMIN

Curcumin, a dietary polyphenol derived from the root of *Curcuma longa* Linn., has shown significant potential as

a chemo preventive, with beneficial effects in all the three stages of carcinogenesis.[34] Curcumin exerts its antitumor effect by modulating the expression of multiple genes involved in tumour proliferation, apoptosis, invasion, and angiogenesis. Other studies have also indicated that curcumin inhibits cell proliferation and survival in breast cancer, colon cancer, prostate cancer, gastric cancer, leukaemia, lymphoma and melanoma [35].Curcumin induces cell apoptosis through complex intrinsic and extrinsic pathways. Curcumin binds to more than 30 different protein targets, including transcript factors (NF-_B and activator protein-1), growth factor receptors [epidermal growth factor receptor(EGFR), human epidermal growth factor receptor 2 (HER2), kinases [mitogen-activated protein kinase (MAPK), PKC and protein kinase A (PKA)], inflammatory cytokines [tumour necrosis factor (TNF) and interleukins], cell cycle-related proteins (p53 and p21),matrix metalloproteinases (MMPs) and urokinase plasminogen activators (u-PA) [20,22,23] Curcumin reduces toxicity induced by anti-cancer agents, sensitizes chemo-resistant cancer cells and Demonstrates synergic effects with different chemotherapeutic agents such as doxorubicin, 5-FU, paclitaxel, vincristine, melphalan, butyrate, cisplatin, celecoxib, vinorelbine, gemcitabine, oxaliplatin, etoposide, sulfinosine, thalidomide, suberoylanilide hydroxamic acid, dasatinib and bortezomib [36].

2.3, ALLIUM SAPIUM

The members of *Allium sapium* (garlic, onions and chives) play a vital role as anti-cancer agent because of the chemo protective phytochemicals present in these herbs [37]. Several phytochemicals inhibit tumour formation by stimulating the protective phase II enzyme, glutathione transferase . GT is a detoxifying enzyme that catalyzes the reaction of glutathione with electrophiles to form compounds that are less toxic, more water-soluble, and can be excreted easily. The phytochemicals that stimulate glutathione transferase activity include sulfides, found in garlic and onions [38]. Garlic is known to have antitumor properties, owing to its content of a wide variety of organic sulfides and polysulfides. Various studies have shown that garlic can slow the development of bladder, skin, stomach, and colon cancers [39]. Risk of cancer in the distal colon was 50% lower in women with the highest consumption of garlic than that of women who did not consume garlic [40]. Garlic can inhibit the formation of nitrosamines, which are potent carcinogens, and can also inhibit the formation of DNA adducts [41]. A study conducted in Greece has shown that high consumption of onions, garlic, and other *Allium* species. is protective against stomach cancer [42].

OTHER CANCER FIGHTING HERBS:

Artemisinin (Figure 1F) is an active terpene of the Chinese medicinal herb Artemisia annua L. (Huanghuahao) The anti-cancer potential of ARTs has been demonstrated in various cancer cells including those of leukaemia and other cancer cells of breast, ovary, liver, lung,

Pancreas and colon [43]. ARTs inhibit angiogenesis which is a vital process in Metastasis [44].Lentinan, a β-glucan found in shiitake mushrooms (*Lentinus edodes*), has been shown to have antitumor activity; it was active against lung carcinoma and 2 human melanomas [45]. It is thought that lentinan has its effects by activating the host immune system. Lentinan stimulates increased production and activity of natural killer cells and macrophages, which destroy tumor cells [46]. Studies conducted in Korea have shown that ginseng (*Panax ginseng*) may lower the risk of cancer in humans [47]. Ginseng extract and powder have been found to be more effective than fresh sliced ginseng, ginseng juice, or ginseng tea for reducing the risk of cancer [48]. Polyphenolics in green tea (*Camellia sinensis*) are known to possess antimutagenic and anticancer activity. Some evidence suggests that tea has a protective effect against stomach and colon cancers (49).

CONCLUSION:

Herbs are very cheap source of medicine which is easily available. They are adjuvant in cancer therapies such as chemotherapy, radiation therapy etc.

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