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Research Article

A REVIEW ON POTENTIAL CURE OF CANCER USING HERBAL MEDICINE

Rachna Pandey

Govt. M.H. College of Home Science & Science for Women (Autonomous), Jabalpur (M.P.)

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ABSTRACT

Cancer is a general term applied to abnormal growth of cells that starts to grow and propagate through uncontrolled cell division and gradually expand throughout body and finally lead to death by invading and destroying normal cells. It is a major public health burden worldwide. Plant derived agents are being used for the treatment of cancer. Common treatments such as radiotherapy and chemotherapy can cause some complications. Worldwide effects are ongoing to identify new anticancer compounds from plants. In recent years owing to the fear of side effects people prefer more and more use of natural plant products for cancer. Medicinal plants are potent natural sources of drugs to treat different human inflammations since ancient time. It will provide a new way to explore the therapeutic value of plants and characterization of biologically active compounds from them that may lead towards developing anticancer drugs and proper treatment of cancer. According to results of this study, herbal extracts have antioxidant compounds that can induce apoptosis and inhibit cell proliferation by the investigated mechanisms. It will be helpful to explore the medicinal value of the plants and for the new drug discovery from them for the researchers and scientists around the globe.

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INTRODUCTION

Cancer is an important health problem in developing and developed countries. It is one of the major causes of death in the world, and it is the second leading cause of mortality after cardiovascular diseases (WHO, 2005). Cancer starts with the deformation of a natural cell caused by genetic mutations in DNA. This abnormal cell reproduces in an abnormal way by asexual reproduction, that is, it ignores signals related to regulation of cell's growth around it, those defective cells might multiply to form a lump of abnormal tissue called a tumour which obtains invasion characteristics and causes changes in surrounded tissues (Smeltzer *et al.*, 2010).

Nowadays, various methods are used for cancer treatment such as chemotherapy, but in this method, because of non-selectivity of medicines, a high percentage of healthy cells will be lost with cancer cells. In order to prepare anticancer medicines from natural resources like plants, testing cytotoxic compounds and screening raw extracts of plants is necessary (Rafieian and Nasri, 2015).

Therefore, availability of natural products with higher effectiveness and lower side effects is desired (Lachenmayer *et al.*, 2010). Medicinal herbs are important for cancer treatment due to their multiple chemical compound for discovering new active materials against cancer (Newman and Cragg, 2007).

In India, there is a long history of using medicinal plants to treat a variety of diseases and up to 80% of the population uses it due to the cultural acceptability of healers, local pharmacopeias, the relatively low cost and difficult access to modern health facilities.

Traditionally, it has been believed that using fruit and leaves from trees/herbs have better potential to heal patient suffering from cancer diseases than modern medicines. Because, these traditional medicinal plants may possess secondary metabolites like Alkaloids, terpenoids, flavonoids, pigments, and tannins which do not directly participate in plant growth and has anti-mutagenic and anticancer properties. These secondary metabolites have biologic effects such as anti-inflammatory, anticancer, contraceptive, and different effects on hematopoietic cells, lipids, and cardiovascular systems.

*Corresponding author: **Rachna Pandey**

Govt. M.H. College of Home Science & Science for Women (Autonomous), Jabalpur (M.P.)

Cancer is a painful disease and fighting against this disease is very important for public health. Regarding the fast progress in the phytochemical study of herbal products, plants are transforming to popular anticancer sources. In cancer, initial tumors will be treated by chemical supplement therapies or surgery. But cancers in the metastasis stage will resist against care.¹² It is believed that anticancer effects of plants develop by suppressing cancer's stimulating enzymes, repairing DNA, stimulating production of antitumor enzymes in cell, increasing body immunity, and inducing antioxidant effects (Sakarkar DM and Deshmukh, 2011).

But in chemotherapy, due to non-selectivity of used medicines, a high percentage of healthy cells will be destroyed with cancer cells. Nowadays, more than 60% of anticancer compounds that are useful for cancer patients are obtained from herbal, marine, and microorganism sources.

The positive effect of plants in cancer treatment has been studied extensively and has shown positive results (Asadi *et al.*, 2016). Also, different researches and studies have proved the positive effect of plants in curing diabetes, fertility and sterility, thyroid disorders, anemia and psychological disorder. Finding plants that replace chemotherapy and cumbersome cures of cancer with cytotoxic effects are necessary (Khalighi *et al.*, 2014).

The aim of this review is to collect available data about the cancer therapy of medicinal plants/herbs so far studied by ethnobotanical surveys and scientifically studied in Madhya Pradesh. The information was obtained from scientific research engines Google Scholar and Research Gate.

Medicinal Plants Have Anticancer Properties

Plant materials was been used for the treatment of malignant diseases for centuries. Recent photochemical examination of plants which have a suitable history of use in folklore for the treatment of cancer had induced often resulted in the isolation of principles with antitumour activity. Random selection screening programme was adopted, since novel compounds may be found anywhere from plant or animal kingdom.

Glycine Max (Soybean)

Soybean phytochemicals such as genistein (4',5,7-tribydroxy isoflavone) inhibit the growth of transplantable human prostate carcinoma. Epidemiological studies have consistently shown that regular consumption of fruits and vegetables strongly associated with reduced risk of developing chronic diseases such as cancer as the phytochemical extracts from it exhibit strong antioxidant activity (Liu, 2004).

The limonoids isolated from the methanol extract of *Khaya senegalensis* proved good anticancer activity (Zhnag *et al.*, 2007). The leaf extract of *Ashwagandha* selectively killed tumor cells and thus it was a natural source for safe anticancer medicine (Widodo *et al.*, 2007).

The fruit of deerberry (*Vaccinium stamineum*) exhibited the anticancer capability of human lung and leukemia cancer cells (Wang *et al.*, 2007). Polyphenolic extracts from *Vaccinium macrocarpon* inhibited the growth and proliferation of breast, colon, prostate, lung, and other tumors as do flavonols, proanthocyanidin, oligomers, and triterpenoids isolated from the fruits of the same (Neto, 2007).

Rosa Damascenes

Rose or rose (scientific name: *Rosa damascenes* Mill) has long been cultivated in different climatic conditions. It is from the family Rosaceace and the flowers and leaves of the plant are its active ingredient is tannin. It is a perennial shrub, close to 5.1 meters in height, and has a cylindrical shaper without grooves. The toxic effects of this essential oil on lung cancer cell lines (A549) and breast (MCF7) have been reported. The ethanol extract of the plant cell has killing effect on cervical cancer cells (HeLa) (Zamiri *et al.*, 2011). *Rosa Damascena* essential oil affects gastric cancer cells in 2 specific ways: the soluble phase increases cell viability, while the vapor phase decreases cell survival. Also, flow cytometry showed that apoptosis is the important mechanism accompanied with cell death (Khatib *et al.*, 2013).

Allium Sativum (Allicin)

Allicin is a principal constituent of raw garlic (Geethangili *et al.*, 2008). Some research demonstrated that its cytotoxic effect has been experienced using a everlasting, human principal fibroblasts, non tumorigenic cell line significant from baby hamster kidney cells and a tumorigenic lymphoid cell line ensuing from a Burkitt lymphoma (Kumar *et al.*, 2004). It was also instituted that the cytotoxic exploit was in the range 2-50µg/ml. It is to be mentioned that the most important fact is a number of organo-sulfur compounds commencing garlic, like S-allylcysteine, are accounted to inhibit the growth of chemically persuaded besides transplantable tumors in reasonably a lot of animal models.

Achyranthes Aspera

The methanol extract of its alkaloid along with non-alkaloid and saponin fractions have been verified noteworthy inhibitory belongings on the Epstein-Barr virus close to the starting antigen commencement persuaded by the carcinogen 12-O-tetradecanoylphorbol-13-acetate in Raji cells at a concentration of 100µg. Throughout in vivo it is found that twostage mouse skin carcinogenesis examination the total methanol extract obsessive a pronounced cytotoxic tumult and in vitro study it is found that the non-alkaloid portions containing mainly non polar complexes showed the bulk of note inhibitory act (Manuel, 2003).

Andrographis Paniculata

A number of previous phytochemical studies of the ethanol extract of the airborne fractions of *Andrographis paniculata* have been noted the segregation of 14 compounds as well as a better part of them is labdane diterpenoids and also flavonoids (Hu *et al.*, 2007). It is to be mentioned that the cytotoxic actions of these compounds have been reviewed against a variety of cell lines and instituted with the rationale of these isolates have a strong tumour inhibitory activity bordering to all examined cell lines which is very considerable. Also, there are a few unnecessary side effects were additionally reported which may embrace gastric upset and fatigue, headache and disturbance of the regular functions of liver and bitter taste too (Nishikawa *et al.*, 2006 and Spinella *et al.*, 2006).

Terminalia Chebula (Harra)

The plant is a superior source of hydrolysable tannins and also its anti-mutagenic feat in *Salmonella typhimurium* has been recognized in some research. Some prior research stated that *Terminalia chebula* fruits crush along with its acetone haul beyond bark have been accounted with capable of anti-mutagenic and anti-carcinogenic association in addition to most importantly Phenols akin to chebulinic acid and ellagic acid and tannic acid are the cancer growth inhibitors introduced within the fruits of *Terminalia chebula* (Prakash *et al.*, 2002 and Devi *et al.*, 1996).

Zingiber Officinale (Ginger)

The rhizome *Zingiber officinalis*, one of the most widely used species of the ginger family is a common condiment for various foods and beverages. The pungent vullinoids i.e., 6-gingerol and 6-paradol, shogaols and zingerone attributed to the anticancer properties of ginger (Shukla and Singh, 2007).

Mangifera Indica (Mango)

It is a very common fruit in India and cultivated in whole country. It is a nutritional add-on used in frequent tribes as a folklore medication. Some prior research on *Mangifera indica* stated that it showed a huge enhancement of excellence of life in cancer patients and that is the most significant fact about the plant (Tamayo *et al.*, 2001).

Curcuma Longa (Turmeric)

It is found that turmeric has been used in the Chinese and Indian pharmacopoeia from ancient time. It is known that turmeric's active ingredient is an extracted compound called curcumin. Some previous studies showed that that curcumin helps to prevent several forms of cancer including lung, breast, stomach, liver, and colon because of its anti-inflammatory as well as antioxidant properties. It stops the growth of cancer by interfering with the cellular signaling phases of cancer (Bollinger, 2015).

CONCLUSION

Treatment of cancer by use of natural products and traditional medicine by applying the concepts of Ayurveda is attaining a great significance scope of cancer research. The compounds alkaloids, phenol compounds, and monoterpenes have antioxidant properties, and inhibition of damage to DNA, cell cycle arrest (especially at the G2/M), induction of apoptosis, inhibition of angiogenesis in tumor cells, and its anticancer effects are new and more effective. In addition to these, indicators such as vinblastine, vincristine, curcumin, Taxol, boswellic acid, and umbelliprenin and compounds such as quercetin, catechin, cucurbitacin, kaempferol, thymol, carvacrol, 1 and 1,8-cineole, α -pinene, myrcene, and β -sitosterol have anticancer effects.

This review shows the therapeutic potential of many traditional medicinal plants/herbs that can be used as anticancer agents in future. Even though many plants/herbs have been used by traditional healers of Indian society, many species still do not have scientific evidence of their anticancer activity. So, it needs scientific study to know whether it has therapeutic potential for cancer treatment or not. In addition to *in vitro* analysis, it needs further investigation at *in vivo* and in clinical trials to know its

anticancer potential more for future use. Furthermore, it needs better knowledge and skills on the mechanism of action in order to establish rational phototherapeutic approaches. Plant-derived anticancer agents are effective inhibitors of cancer cell lines, making them in high demand. Exploitation of these agents needs to be managed to keep up with demands and be sustainable.

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