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Breast Cancer and Use of Alternative Medicine: A Mini Review

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Review Article

ABSTRACT

Breast cancer is the most frequent cancer in women responsible for almost 20% of all cancer deaths [1]. The main therapies used for the treatment of breast cancer are surgery [2], chemotherapy [3] and radiotherapy [4,5]. Moreover, complementary and alternative medicines are being increasingly recognized as useful treatments for breast cancer. The present review aims to consolidate a comprehensive role of different alternative medicines [6-13] which can be used in the treatment of breast cancer.

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INTRODUCTION

Breast cancer is the most prominent form of cancer diagnosed and the leading cause of cancer death in European women. Breast cancer represents a heterogeneous group of tumors with different biologic behavior, prognosis and response to treatment [14]. The mortality due to breast cancer has been reduced in the last decades due to the earlier detection and the improvements in treatment [15]. Certain epidemiologic studies illustrated that basal-like tumors were more likely to arise as compared to the luminal tumors among women with early menarche, younger age at full term pregnancy, higher parity, higher body mass index, shorter duration of breast feeding, and higher waist to hip ratio, especially among pre-menopausal patients [16]. Unlike other cancers, breast cancer is eminently treatable if detected at an early stage. However, appropriate breast cancer education and intervention strategies are required for its early detection and treatment. Currently, breast cancer is treated using three different methods: surgery, chemotherapy and radiotherapy. The preferred method of treatment for many women with early breast cancer is conservative surgical therapy (principally axillary dissection and lumpectomy) [17]. Research carried out previously suggested that hormonal therapy, radiation therapy and chemotherapy can all contribute to the development and persistence of side effects, including fatigue, sleep difficulty, pain, cognitive impairment, bone loss and cardio toxicity [18]. In the last 20 years, the breast cancer treatment has undergone multiple modifications, evolving from aggressive surgical interventions focused on the regional control, to the multidisciplinary treatment that allows local and systemic control of the disease [19].

In India, 7500 species of medicinal plants are widely used by all sections of the population. During the last few decades there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of India [20,21]. Researchers are currently working to better understand the importance of complementary medicine in breast cancer treatment. Complementary and Alternative Medicine (CAM), as defined by the National Center for Complementary and Alternative Medicine (NCCAM), "is a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine" [22]. Different types of alternative medicines can be used for the treatment of breast cancer. It includes herbal medicines, homeopathy, Ayurvedic medicines, acupuncture, Chinese medicine and

Unani medicines [23]. Description of these medicines along with their use in treatment of breast cancer is discussed in this review.

HERBAL MEDICINE

Medicinal herbs and phytochemicals obtained from them are being used as complementary treatments for cancer. A large volume of clinical studies have reported the beneficial effects of herbal medicines on the survival, quality of life and immune modulation of cancer patients. Herbal medicines are more useful when used in combination with conventional therapies.

Metabolites like Resveratrol (Phytoalexin) derived from Grapes have anti-breast cancer effects. Also, Pomegranate extract has anti-cancer effect on breast cancer cells [24]. Use of vitamin A in the treatment of breast cancer has been reported previously. In one of the clinical trials, when vitamin A was used for the treatment of breast carcinoma patients, at 97 months post-treatment, there was a significant reduction in recurrence of local breast cancer in premenopausal women [25].

Effect of phytoestrogens on breast cancer was also studied [26-30]. Phytoestrogens include lipophilic lignans and water-soluble isoflavones. Soy-derived phytoestrogens are recommended for treating postmenopausal symptoms in women with breast cancer undergoing tamoxifen therapy. The principal constituents of soy bean plant extracts, including isoflavones genistein and daidzein, are structurally similar to 17 β -estradiol and can confer weak estrogenic effects. However, among six related clinical trials conducted so far, only one concluded that isoflavone was associated with a reduced risk of breast cancer [31].

CHINESE MEDICINE

Traditional Chinese medicine (TCM) originated in ancient China and has evolved over thousands of years [32]. TCM practitioners use herbal medicines and various mind and body practices, such as acupuncture, to treat or prevent health problems. Investigations of TCM have uncovered a number of anti-breast cancer agents. However, mechanism of action of these agents is not known yet. Various compounds from TCM having anticancer activity include flavonoids, alkaloids, coumarins, artemisinin, polyphenols, terpenoids and quinones. These compounds have been used as dietary supplements and health foods [33]. However, clinical trials are still recommended for their applications in the treatment of breast cancer.

Use of Acupuncture: The National Institutes of Health (NIH), USA, has defined acupuncture as a family of procedures involving stimulation of anatomical locations on the skin by a variety of techniques [34]. The most studied mechanism of stimulation of acupuncture points uses penetration of the skin by thin, solid, and metallic needles, which are manipulated manually or by electrical stimulation [35]. Acupuncture have been used effectively on cancer-related hot flushes, nausea and vomiting induced by chemotherapy, pain, fatigue, Lymphoedema and Leukopenia [36,37].

AYURVEDIC MEDICINE

Ayurvedic medicine (also called Ayurveda) is one of the world's oldest medical systems. It originated in India more than 3,000 years ago and remains one of the country's traditional health care systems [38,39]. Some herbs like Turmeric (*Curcuma longa*), Amla (*Phyllanthus emblica*), Ashwagandha (*Withania somnifera*), Boswellia, Rhubarb (*Rheum rhabarbarum*) root, *Nigella sativa* etc. have been tested previously for their anti-cancer activity [40].

Use of z-Guggulsterone and Guggulipid extracted from Ayurvedic medicine plant *Commiphora mukul* was reported by Guoqin Jiang et al [41]. In this study, the anti-breast-cancer efficacy and apoptosis inducing activity of GL was evaluated *in vitro*. The study concluded that the β -Catenin signaling pathway is the target for GL-induced growth inhibition and apoptosis in human breast cancer. Michelle Xiao and Dong Xiao [42] also reported that Guggulipid multitargeted cancer chemopreventive and chemotherapeutic agent, although the action mechanisms of GL are not completely understood.

Another study carried out by Bindu Noolu et al. [43] reported that the *Murraya koenigii* leaf extract inhibits proteasome activity and induces cell death in breast cancer cells. *Murraya koenigii* Spreng which is a medicinally important herb of Indian origin, has been used for centuries in the Ayurvedic system of medicine.

HOMEOPATHIC MEDICINE

Homeopathy is a therapeutic method of using preparations of substances whose effects when administered to healthy subjects correspond to the manifestation of the disorder in the individual patient [44].

The effectiveness of homeopathic treatment for skin reactions during radiotherapy treatment for breast cancer was tested by Balzarini [45]. Total 61 Patients were randomized into two groups. First group of patients received three granules of belladonna 7CH twice daily with X-ray 15CH once daily (the "CH" means centesimal Hahnemannian potency) and second group of patients received placebo. Patients treated with homeopathy noted decrease in skin temperature. However, by the end of the 10-week follow-up, these differences were no longer significant.

Thompson et al. [46] compared placebo with homeopathy in 53 breast cancer survivors with estrogen withdrawal symptoms. Patients who received homeopathy were individually prescribed 71 different remedies, most commonly sepia, belladonna, carnosin, sulphur, natrum muriaticum, and arnica (mostly high potencies). There was no significant difference noted between the homeopathy and the placebo group.

Homeopathic Carnosin, Conium, Thuja and Phytolacca were found to be cytotoxic *in vitro* to breast adenocarcinoma cell lines MDA-MB-231 and MCF-7 causing apoptosis and cell cycle delay/arrest [47,48].

In a recent study, homeopathic remedies were used for patients who suffered from cancer. Although this intervention had many significant consequences in reducing clinical symptoms, it didn't have the same effects on fatigue, anxiety, depression and mood disturbances of those patients [49,50].

CONCLUSION

Currently, surgery, chemotherapy and radiotherapy are the widely used therapies for the treatment of breast cancer [51-63]. Alternative medicines like herbal medicines, acupuncture, homeopathy and Ayurvedic medicines can be used along with these treatments to cure breast cancer as well as to improve the quality of life of the patients suffering with breast cancer. These complementary and alternative medicines have shown anti-breast cancer effect. However, more studies should be carried out to significantly prove the anti-breast cancer effects of these medicines. Also, more clinical trials should be carried out to prove the safety and efficacy of alternative medicines.

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