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Anti-Breast Cancer Property of Blueberry

Mansoureh Masoudi¹, Mino Movahedi^{2*}

¹Valiasr Eghlid hospital, Shiraz University of medical sciences, Shiraz, Iran

²School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

Corresponding author: Mino Movahedi, MD in Obstetrics and Gynecology, Assistant Professor, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Introduction: Blueberries are perennial herb, belong to *Cyanococcus* family. This plant is native to North America. The aim of this study was to overview Anti-Breast cancer property of Blueberry.

Methods: This review article was carried out by searching studies in PubMed, Medline, Web of Science, and Iran Medex databases. The initial search strategy identified about 102 references. In this study, 54 studies were accepted for further screening and met all our inclusion criteria [in English, full text, anti-Breast cancer effect of blueberries and dated mainly from the year 2005 to 2016. The search terms were “Blueberries”, “Anti-Breast cancer properties”, “pharmacological effects”.

Result: It is commonly used for its chemotherapeutic effect, antioxidant effect, and antitumoral effect. Most importantly, it possesses anti-breast cancer activity that is related to its chemical compound, mostly anthocyanins.

Conclusion: the results from this review are encouraging for the use of Blueberries as an anti-breast cancer agent. Result showed that blueberry anthocyanins and its pyruvic acid adducts suggested anticancer properties by inhibiting cancer cell proliferation and by acting as cell ant invasive factors and chemo inhibitors.

Keywords: Blueberries, Phytochemicals, Therapeutic effects, Pharmacognosy, Alternative and complementary medicine.

INTRODUCTION

herbal medicine is shown to contribute effectively in remedy and well-being of many diseases [1-24]. Blueberries are perennial, erect, deciduous shrubs herb, belong to Cyanococcus family [25]. This plant is native to North America [26]. They are varied in size from 10 centimeters to 4 meters in height [27]. The fruit is a berry [28] with a sweet taste when mature [29]. "Blueberry" are presently divided in family Cyanococcus of the genus Vaccinium [30]. Blueberries contain anthocyanins [31], other polyphenols [32] for their potent role in the human body [33]. Most polyphenol studies have been carried out utilizing the highbush variety of blueberries, while content of polyphenols and anthocyanins in wild blueberries transgress values discover in cultivars [34].

RESULT

Breast cancer

The suppressory effect of blueberries on inflammation-induced TNBC was investigated. The result suggest that blueberries probably prohibit TNBC and TNBC-related metastasis through lessening inflammation by cytokine-operated pathways, subsequently by decreasing tumor development and metastasis [35].

Both prophylactic and remedial activities of diet add with total blueberry powder was tested. The effect on breast tumorigenesis was largely due to down-regulation of CYP 1A1 and ER- α gene expression as well as conducive modulation of microRNA levels. The result suggest that the blueberry blend is efficacy in preventing E2-mediated breast tumorigenesis in both prophylactic and remedial modes [36].

The potent carcinoma stem cells TAM modifying effects of pterostilbene in mammary cancer was investigated. The result demonstrated that Pterostilbene efficiently inhibit the generation of CSCs and metastatic potent under the effect of M2 TAMs through modifying EMT related signaling pathways, particularly NF- κ B/miR488 circuit. Accordingly, pterostilbene could be a very satisfying anti-CSC candidate [37].

The effect of dietary agents target mammary epithelial cells was investigated. The outcome showed that dietary agents contribute in an estrogen receptor-dependent and -independent mammary carcinoma in targeting stem/progenitor cell society [38]. In an animal study on nude mice, two dosages of blueberry powder was tested against MDA-MB-231 tumor development. The result demonstrated blueberry powder possesses the oral antitumor and metastasis activity against TNBC [39].

The anticarcinoma action of pyruvic acid extract was investigated. Result demonstrated that blueberry anthocyanins and pyruvic acid possess anticarcinoma properties through suppressing proliferating cancer cell and by acting as cell noninvasive agents. The pyruvic acid extract showed a more noticeable effect in MDA-MB-231, suggesting an effect autonomous of estrogen receptors [40].

In an in vitro and in vivo study, the chemo preventive activity of blueberry extract in triple-negative mammary cancer cell lines was investigated. The result showed blueberry chemical compounds have the inhibitory effect on the MDA-MB-231 cell development and metastatic via regulating the PI3K/AKT/NFkappaB pathway [41].

Phenolic constituents of Extracts of six berries were evaluated. Blueberry showed to have moderate apoptotic effects against breast cancer cell line [42].

Result showed that berries have biological effect reducing some kinds of carcinoma and hypertension. It was shown that blueberry ingestion increases NK cells and decrease AIx, ASP, and diastolic pressures in inactive men and women [43].

The result showed that the caspase-9 and cytochrome c expression were clearly increased post- anthocyanins therapy. Besides, it was indicated that the p53 expression was increased indicating that the anthocyanins enable to p53 methylation down regulation [44].

In an animal study, the effects of anthocyanin of blueberry extracts on B16-F10 metastatic melanin-forming cells was evaluated. The results indicate that the anthocyanins from this type could be utilized as a chemo preventive or complementary therapy for metastasis management [45]. In a study, pterostilbene was applied to inhibit the enrichment of hepatoma CSCs and can be used as a mixed candidate for patients with HCC [46].

The bioactivity of blueberry and its wild species was investigated. The results showed high antioxidant activity and development inhibitory effect of HL-60 human leukemia cells associated to total polyphenols of BB [47]. The Bioactivity of Anthocyanins on inhibiting carcinoma cells was investigated. The result showed that this plant is an encouraging therapy to inhibit human colon or colorectal cancers [48].

In another study, cancer-preventive effects of BB was not confirmed. Blueberry influenced ACF incidence in distal colon and tumor progression in duodenum. Data indicated BB potent for reducing the speed of tumor progression [49]. Antiangiogenic effects of oral BBE was assessed. Oral intake of blueberry can be a promising therapy in treatment of endothelial cell neoplasms in kids [50].

Preventive activity against colon carcinogenesis of Pterostilbene was tested. The results suggest that pterostilbene from blueberries, is a very important agent in the prevention of colon carcinoma [51]. Inhibitory prostate cancer effects of pro anthocyanidin-rich fractions from blueberry fruit was investigated. Result indicate that pro anthocyanidins from blueberry is effective mainly on androgen-dependent development of prostate carcinoma cells [52].

The anti-cancer effects of three fractions from BB was examined. The data indicate that flavonoids from blueberry can decrease considerably MMP activity, subsequently reduce total ECM degradation. This ability probably is of high significance in managing tumor metastasis [53].

Anti-proliferation and apoptosis induction effects of BB was assessed. Result suggested that Anthocyanin from BB increases DNA fragmentation 2-7 times, showing apoptosis induction. The result suggest that blueberry intake probably lessen the risk of colon cancer [54].

CONCLUSION

The results from this review are encouraging for the use of Blueberries as an anti-breast cancer agent. Result showed that blueberry anthocyanins and its pyruvic acid adducts suggested anticancer properties by inhibiting cancer cell proliferation and by acting as cell ant invasive factors and chemo inhibitors.

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