

Role of natural herbs and phytochemicals to minimize tumor and economic burden in breast cancer treatment

Maria Shoaib¹
Syed Ahsanuddin Ahmed²

¹Dow Medical College, Dow University of Health Sciences, Karachi,

²Sindh Medical College, Jinnah Sindh Medical University, Karachi, Pakistan

Dear editor

We read the article “Economic burden related to chemotherapy-related adverse events in patients with metastatic breast cancer in an integrated health care system” by Rashid et al with great interest and would like to add some views in its support.¹

Carcinoma of breast is the most common malignancy in females worldwide, contributing to one third of almost all known neoplasm. It is the second leading cause of mortality in females. As per a public survey it is estimated that globally more than 1,000,000 women are diagnosed with breast cancer annually, and 410,000 affected women do not survive. This cancer is also known to cause substantial psychological and economical burden on the patient and their families.^{2,3}

Indeed, the economic burden of approximately >US \$572 million is huge. Fortunately breast cancer has good survival outcomes, but with the probability of costly treatment. To cure breast cancer, various expensive therapeutic regimens including cycles of chemotherapy, cancer gene receptor therapy, radiation, and surgery, and complex diagnostic modalities such as radio imaging and identification of oncogene and tumor markers, are used. The morbid adverse effects of cytotoxic anticancer drugs or radiation often lead to unanticipated hospitalization and follow-up visits with additional laboratory work, imaging, and medications to treat adverse events augmenting economic burden on the patient and the health care system. Newer, targeted therapies and personalized medicine are pricier but may reduce repeated detrimental events, improving adherence and potentiating chances of overall patient survival.¹

There is scientific evidence that various dietary herbs and plant products are cancer preventive. Phytochemical compounds have shown anticancer potential acting via biological pathways and modulating immune systems to lessen neoplastic growth. They trigger immune cells such as natural killer (NK) cells, cytotoxic T cells, chemokines, and tumor necrosis factor- α ; by virtue of this quality they can be promising alternate/ adjuvant options for therapeutic or preventive strategies for breast cancers. Apart from being effective and less toxic they complement conventional chemotherapeutic drugs and also are able to counterbalance any repetitive resistance to hormonal and targeted therapy. This can thus help reducing chances of adverse events and aiding in alleviation of patients’ tumors and economic burden.^{4,5}

Correspondence: Maria Shoaib
Dow Medical College, Dow University of Health Sciences, 176/Y Block 2 PECHS Karachi, Pakistan
Tel +92 333 328 9909
Email syedamariashoaib@gmail.com

Extracts and juices of medicinal plants like *Withania somnifera* (rennet), *Aphanamixis polystachya* (Pithraj tree), *Dysoxylum binectariferum* (rosewoods), *Vaccinium macrocarpon* (cranberry), *Glycyrrhiza glabra* (liquorice), *Uncaria tomentosa* (cat's claw), *Panax ginseng* (ginseng), *Prunus armenica* (apricot), *Echinacea* (cone flower), *Hedyotis diffusa* (*Oldenlandia*), and *Arctium lappa* (greater burdock) possess bioactive immunomodulators as their main constituents producing the anticancer effects via activation of lymphocytes (epigallocatechin-3-gallate, β -carotene, quinic acid, and ginsan) and anti-inflammatory agents (curcumin, glabridin, arctigenin, and ajoene).⁵

Bioactive composites obtained from dietary sources such as fish in the form of omega-3 fatty acids; resveratrol (3,5,40-trihydroxy-transstilbene); naturally occurring phytoalexin in grapes; and epigallocatechin gallate a polyphenolic compound found in green tea and fruit like red dates (*Ziziphus jujube*) are rich in antioxidant properties, by stimulating protective enzymes such as glutathione transferase, and prevent the neoplastic proliferation. The volatile oils and extracts of herbs in the kitchen cupboard like *Allium sativum* (garlic), *Curcuma longa* (turmeric), *Camellia sinensis* (tea plant) and flax seed inhibit formation of mevalonate that lessens the cholesterol synthesis and tumor growth. This induces anti-proliferating and apoptotic effects in various breast cancer cell lines promoting the herbs potential use for inhibiting carcinogenesis.^{5,6}

Knowledge of dietary compounds and traditionally used medicinal herbs having possible preventive and curative effects on cancer, may rationalize further translational application. We emphasize the importance of a remedial portfolio of natural bioactive compounds for treating breast

cancer, and its prevention. Clinical trials and attempts to characterize these plants and their extracts will surely help to reduce economic burden from costly chemotherapy and cancer receptor gene therapy, and create a breakthrough in the world of medicine by helping many underprivileged, and those who cannot afford treatment.

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Disclosure

The authors declare no conflict of interest in this communication.

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