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THE USE OF BROCCOLI AND BROCCOLI SPROUTS IN THE PREVENTION ANDTREATMENT OF VARIOUS DISEASES

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ABSTRACT

All over the world preference is given to natural plant products, as medicines and vegetables for the prevention and treatment of various diseases. Epidemiological studies have shown that natural foods strengthen the immune system and act asanti-inflammatory, antioxidant, anti-mutagenic and anti-cancer agents. One of such agents is the miraculous vegetable broccoli and broccoli sprouts from the Brassicaceae family.

KEYWORDS

Broccoli, broccoli sprouts, medical significance, glucosinolates, wide application in medicine.

Introduction

In all situations-cases, preference is given to natural, medicinal plant products. As medicines and including vegetables, since the ancient medical system, such as Ayurveda, has been used for a long time to treat various diseases. In recent years, much attention has been paid to plant products for the prevention of various diseases due to their less painful consequences. Epidemiological studies have shown that natural foods strengthen the immune system and act as anti-inflammatory, antioxidant and anti-cancer agents, one of such agents is broccoli and broccoli sprouts.

Materials and Methods

Nutrition plays an important role in health and disease; some nutrients are not only necessary but essential for optimal health. Traditional foods are seen as sources of energy and life that can maintain homeostasis through their nutrients. However, it is now recognized that certain foods can provide more than just energy and essential nutrients.

Nutrition plays an important role in health and disease; some mono, edible vegetable and herb sprouts have attracted increasing attention in recent years and are considered functional foods due to their valuable health-promoting properties. including 3-day-old broccoli sprouts (brassica oleracea l. var. italica) are highly valued for their significant content of 10-100 times more glucoraphanin than the corresponding mature plants. notably, sprouts of many broccoli varieties contain insignificant amounts of indole glucosinolates, which predominate in mature vegetables and can produce degradation products that can enhance oncogenesis. it follows that a small amount of cruciferous sprouts may protect against cancer risk as effectively as much larger amounts of mature vegetables of the same variety.

Epidemiological studies support the potential role of nutritional factors in bladder cancer risk, such as increased fluid intake and consumption of cruciferous vegetables, especially broccoli. In a large prospective study, there was a 39% reduction in the risk of bladder cancer with ≥2 servings of broccoli per week compared with <1 serving (p=0.009). Glucoraphanin (a precursor of sulforaphane) is the predominant glucosinolate found in both broccoli and broccoli sprouts. To elucidate possible mechanisms of action by which broccoli isothiocyanates may inhibit bladder cancer cell viability, we examined the ability of these compounds to modulate the cell cycle and induce apoptosis. Our studies demonstrate the antitumor activity of broccoli, broccoli sprouts, and their pure isothiocyanates using in vitro and in vivo bladder cancer models.

A study on rats showed:

1. Dietary administration of lyophilized aqueous extract of broccoli sprouts significantly and dose-dependently inhibited the development of bladder cancer induced by n-butyl-n-(4-hydroxybutyl) nitrosamine, including reduced cancer incidence, smaller tumor size, and reduced cancer invasiveness.
2. Inhibition of bladder cell carcinogenesis by broccoli extract was associated with increased induction of glutathione-s-transferase (GST) and nad(p)h:quinone oxidoreductase 1 (NQO1), which are important protective enzymes against oxidants and carcinogens.
3. GST are important phase ii enzymes that typically detoxify carcinogenic metabolites with the participation of the conjugate of many electrophilic substrates with glutathione, in vitro studies have shown that isothiocyanate extract of broccoli sprouts induces mitochondria-mediated apoptosis, as well as arrests cells in s- and m-phases.

Sulforaphane, a natural compound derived from broccoli sprouts, has been shown to have anti-cancer activity. This study shows that sulforaphane inhibits breast cancer stem cells in vitro and in vivo.

Conclusion

Brassicaceae vegetables are quite unique due to their bioactive metabolites, consisting of a large number of sulfur-containing compounds such as glucosinolates, along with phenolic acids and flavonoids. Numerous in vitro and in vivo studies have shown that broccoli sprouts possess various biological properties, including antioxidant, antitumor, anticancer, antimicrobial, anti-inflammatory. Preventive trials of whole foods or simple extracts offer prospects for effectively reducing the growing global burden of cancer. Thus, brassicaceae plants represent an excellent source of nutrients and phytochemicals that promote health, which overall contributes to the dietary importance of these food crops as beneficial against certain types of diseases.

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