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Review Article

Systematic Analysis of Antioxidant Activity of Unani Herbal Medicine

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Abstract

Antioxidant, the word itself is magic. It is a molecule that inhibits the oxidation of other molecules. Damage to cells caused by free radicals is believed to play a central role in the aging process and in disease progression. Antioxidants are our first line of defense against free radical damage, and are critical for maintaining optimum health and wellbeing. The need for antioxidants becomes even more critical with increased exposure to free radicals. Pollution, cigarette smoke, drugs, illness, stress, and even exercise can increase free radical exposure. Because so many factors can contribute to oxidative stress, individual assessment of susceptibility becomes important. Many experts believe that the Recommended Dietary Allowance (RDA) for specific antioxidants may be inadequate. As part of a healthy lifestyle and a well-balanced, wholesome diet, antioxidant supplementation is now being recognized as an important means of improving free radical protection. This paper gives information about the herbs having antioxidant activity.

Keywords: Unani Herbs; Oxidative Stress; Free Radical Production; Antioxidants

Background

Herbs contain anti oxidant protects from oxidative stress-related diseases. It has been hypothesized that plant antioxidants may contribute to the beneficial health effects. Our aim is to use Unani herbal medicines and food with total antioxidant content in extensive clinical research studies.

Introduction

Antioxidant, the word itself is magic. It is a molecule that prevents the oxidation of other molecules. As antioxidants have been reported to prevent oxidative damage caused by free radical [1,2], these free radicals arise normally during metabolism. Environmental factors such as pollution, radiation, cigarette smoke and herbicides can also produce free radicals. Oxidative stress has been shown to be involved in the development and pathogenesis of a wide variety of diseases ranging from hypertension, diabetes, arthritis, ageing and related disorders, immune and inflammatory disorders, postmenopausal syndrome to Alzheimer's and other neurodegenerative disorders.

Plant antioxidants are more than mere supporting players in the battle against cellular damage and disease. According to folklore certain plants play specific role in disease prevention and treatment. A well-known hepatic antioxidant, silymarin, from milk thistle (*Siliban marianum*) inhibits liver damage by scavenging free radicals [4,5]. This powerful antioxidant protects the liver against alcohol and pharmaceutical injury. A lot of medicinal plants, traditionally used for thousands of years, are present in a group of herbal preparations of the Indian traditional health care system proposed for their antioxidant activities. Among the medicinal plants Amla (*Emblica officinalis* L.), Haldi (*Curcuma longa* L.), Aam (*Mangifera indica* L.), Karela (*Momordica charantia* L.), Sandal (*Santalum album* L.), Asgandh (*Withania somnifera linn)* are viewed for their historical, etymological, morphological, phyto-chemical and pharmacological aspects [3]. The plants described below contain antioxidant principles used in traditional medicine in the past, but they are indicated only empirically. Hence it is the need to study these drugs scientifically.

Amla: (Emblica officinalis linn)

Figure 1

Many herbs are considered as powerful antioxidants. Among them amla is one of the most potent antioxidant. It is known since ancient times for its medicinal value and is commonly used in Unani medicine. It is a major herb used in well-known rejuvenative herbal preparations. It is said that Amla can bring back youth and grace to an ageing body and provide renewed vitality in the young.

The fruit is reputed to have the highest content of vitamin C and is being considered as a good replacement for vitamin C than ascorbic acid. Juice has 20 times more vitamin C than orange juice. Studies indicate that the naturally occurring vitamin C is easier for the body to absorb than synthetic vitamin-C. It has also been found that vitamin C accounts for approximately 45-70% of the antioxidant activity in Amla.

The extract of Amla has been found to improve glucose metabolism in diabetes. Treatment with extract of Amla brought about effective normalization of blood sugar levels. Administration of the extract of Amla significantly reduced various oxidative stress indices commonly seen in diabetes [6,7]. Amla is also effective in reducing triglyceride and cholesterol levels and also protected the heart against injury from free radicals [8,9].

The Extract has been shown to protect the skin from the damaging effects of free radicals. Amla is suitable for use in anti-ageing, sunscreen and general-purpose skincare products [11,12]. Further, the extract of the herb was also found to protect the liver and the kidney from the harmful effects of anticancer drugs [13,14].

Asgandh (*Withania Somnifera*)

Withania somnifera known as "Asgandh" is habitually referred to us "king of herbal kingdom". It possess immunomodulatory anti-inflammatory, anti-tumor, antioxidant and anticancer properties. Many pharmacologically and medicinally important chemicals of *Withania somnifera* such as Withaferins, sitoindosides and various alkaloids protect the cells from oxidative damage and disease.

Figure 2

The administration of extract of Asgandh significantly reduced the lung tumor nodule formation and also reduced leucopenia induced by cyclophosphamide treated experimental animals, indicating its usefulness in cancer therapy [14,15]. Withania increase the WBC count, reduce leucopenia and also increased bone marrow cellularity.

Tea (*Camellia sinensis*)

Figure 3

Tea infusion is characterized by a high content of flavonoids. Flavonoids are a large group of phenolic products of plant metabolism with a variety of phenolic structures that have unique biological properties and may be responsible for many of the health benefits attributed to tea. Many in vitro studies show that the flavonoids present in tea have strong antioxidant property and may therefore protect cells and tissues against free oxygen radicals [16,17]. Tea is an important source of flavonoids in the diet with levels approaching 200 mg/cup for a typical infuses of black tea [19]. The flavonoids found in green and black tea are very effective antioxidants both in vitro and vivo. The uptake of tea flavonoids has been studied extensively as well as the changes in antioxidant capacity of plasma after tea consumption and it was shown that consumption of tea reduced oxidative damage in the body [18].

Zanjabeel (*Zingiber officinalis Linn*)

Figure 4

Ginger tea has long been an herbal remedy for nausea, coughs and asthma, related to allergy or inflammation; soft drink ginger is still remains a popular beverage for the relief of stomach upset. Externally, Ginger is a rubefacient, and has been relieving headache and toothache [20].

The mechanism by which Ginger produces anti-inflammatory activity is that of the typical non-steroidal anti-inflammatory drug. This common spice is a more biologically active prostaglandin inhibitor than onion and Garlic. Ginger reduce blood platelet "clumping," and it inhibit the fatty acid oxygenases from platelets, thus decreasing the clumping of these blood cell components. In one study, Danish women between the ages of 25 to 65 years consumed either 70 grams raw onion or 5 grams raw ginger daily for a period of one week and measured thromboxane production. It discovered that ginger reduced thromboxane production by almost 60% than onion [21,22].

In a series of experiments with rats discovered that extracts of Ginger preparations inhibited gastric lesions by up to 97%. Because it contain effective constituents such as zingiberene, the main terpenoid and 6-gingerol, the pungent principle [22].

Aslasoos (*Glycyrrhiza glabra Linn*)

Figure 5

The pharmacological effects of Licorice rhizomes and roots are practically attributed to the presence of a triterpene saponin called *glycyrrhizin,* which is about fifty times sweeter than sugar, and has a powerful cortisone-like effect. Several studies have reported that consuming 6-8 ounces of licorice candy daily for several weeks is "toxic" due to the cortisone-like effects of canned licorice extract. The above amount of this compound is very large compared with the relatively small amount found in supplements. Proper treatment restores patients to normal.

In addition, Licorice rhizomes and roots have high mucilage content. When mixed with water, the resulting preparation has a very pleasant odor and taste, and acts as an effective demulcent on irritated mucous membranes. One study found that glycyrrhizin was as effective a cough suppressant as codeine. An experiment study on mice found that glycyrrhizin protected against skin cancer. The authors speculated that it might prove useful in protecting against some forms of human cancer as well [23].

Glycyrrhetic acid (G.A.) is extensively used as anti-inflammatory in peptic ulcer. It concluded that G.A. may be preferred instead of cortisone, because it is safe, especially when prolonged treatment is required [24]. Licorice in very large amounts can promote hypokalemia and hypertension. For these reasons people with heart problems and high blood pressure are advised to avoid consuming large quantities of Licorice or its components.

Zardchob: (*Curcuma longa Linn*)

Figure 6

Turmeric is the main ingredient in curry, is also an amazing source of natural medicines. It's a powerful anti-cancer as well as an anti-inflammatory medicine [25].

Currently, Turmeric is used in India to treat anorexia, liver disorders, cough, diabetic wounds, rheumatism, and sinusitis. In one study Turmeric extract which contains an active principle named Curcumin is a potent anti cancer agent was tested for its anticarcinogenic and antimutagenic properties. Laboratory experiments was found that this ancient spice reduced the size of the tumors in mice [26].

Curcumin has three main mechanisms of action: 1) antioxidant activity; 2) lipoxygenase inhibitor; and 3) cycloxygenase inhibition. By inhibiting the associated biochemical pathways, inflammation is curtailed. Modern science thus confirms what traditional healers have known for centuries. Namely, that the fresh juice from the rhizome will reduce swelling in recent bruises, wounds and insect bites; and that the dried powdered root kills parasites, relieves head ache and cold [27].

Palas papda (*Butea frondosa-Quercetin*)

Figure 7

Quercitin is a powerful antioxidant and contain natural flavone widely distributed in the plant world. It is the commonest flavonoid in higher plants. It is usually present as a glycoside such as rutin, isoquercitrin, quercitrin, hyperin, and quercimeritrin [28].

Shahed (Honey)

Figure 8

Antioxidants are plentiful in plant foods, particularly those that have bright colors. Thus consume a good diet, rich in antioxidant plant foods will provide health- protective effects. Diet-derived antioxidants may therefore be particularly important in protecting against chronic diseases.

Honey is a natural product made by honeybees (*Apis mellifera*) which have highly variable sensorial and physicochemical characteristics. Different honey types have diverse phenolic content and consequently different antioxidant activity. In addition, processing, handling and storage of honey may influence its composition [29].

Anjeer (Ficus carica linn)

Figure 9

Ficus carica leaves in addition to their anti-diabetic properties; it has strong antioxidant and anti-inflammatory properties also. In a clinical trial conducted for its anti-inflammatory and antioxidant activity "F. Carica" leaves. The study validated that the antioxidant effect of fig leaves is likely due to the presence of steroids and flavonoids and the anti-inflammatory activity could be due to free radical scavenging activity [30].

Dried fruits have a greater nutrient density, greater fiber content and significantly greater phenol antioxidant content compared to fresh fruits. The quality of the antioxidants in the processed dried fruit is the same as in the corresponding fresh fruit. Therefore, more dried fruits should be recommended to be added to the diet.

Conclusion

Numerous studies have reported that medicinal plants possessing antioxidant activity reduce oxidative stress and inhibit free radical production and restore health. Based on these preclinical studies it is concluded that further randomized clinical studies using antioxidant herbs may be conducted. They should be guided not only by sound clinical judgment, but also by patient's preferences, needs, and values.

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