



Short Brief

Diosmin: A potential natural drug

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Abstract: Diosmin is of potential interest for its possible role in human health. Diosmin is a flavone glycoside that is a member of the class of flavonoids, which are secondary metabolites found in large quantities in plants and vegetables. Diosmin is specifically the glycoside of the aglycon diosmetin (3', 5, 7-trihydroxy-4'-methoxyflavone), which is found naturally and in large quantities in citrus fruits as well as in a number of herbal medicines. It is useful in the treatment of a number of illnesses. Its biological roles, including its use as a phlebotonic drug and its extraordinary antioxidative, anti-hyperglycemic, anti-inflammatory, anticancer, and antibacterial activity, have been highlighted by numerous in vitro and in vivo research. We looked at a summary of diosmin's chemistry, biochemistry, and pharmacology, focusing on its main biological characteristics, therapeutic uses, and possible targets of action after activation or blockage of the pathways linked to its use.

Keywords: Diosmin; Natural drugs; human disease

Background

Medications made from plants or herbs are also commonly referred to as botanicals, phytopharmaceuticals, herbal medicines, and phytomedicines. Phytomedicines are available over-the-counter as dietary supplements in various nations. As a result, comprehensive scientific studies on their quality, safety, and effectiveness have not been conducted. Other countries, particularly those in Europe, have more stringent laws and demand a prescription in order to obtain phytomedicines[1-15].

The ever-increasing epidemiological impact of major, life-threatening diseases on the world's population has compelled researchers and doctors to develop stringent treatment regimens. Given the recent increase in the prevalence of fatal neurodegenerative illnesses, effective therapeutic approaches are also required. However, adverse side effects associated with their use have soiled the present traditional treatments for disorders. Their exorbitant prices are another factor that restricts their use. In order to overcome these limitations, the most common alternative to synthetic medications is the long-standing practice of employing traditional herbal remedies[16-18]. Nature is the best source of naturally occurring herbs that contain phytomedicine and pharmacologically active phytochemicals. Their affordability, ease of use, and, most importantly, their efficacy and safety have all contributed significantly to their effectiveness against some of the most severe neurological conditions and to the trust of consumers. Clinical data and laboratory studies provide strong support for their therapeutic effectiveness against a variety of illnesses, such as stroke, Alzheimer's disease, Parkinson's disease, Huntington's disease, cancer, infectious disorders, etc[2, 5, 17, 19-27]. Although their exact mode of action is still unknown, their antioxidant and anti-inflammatory qualities are assumed to be the reason of their neuroprotective effects. This editorial's primary focus is on the effects of various phytochemicals and herbal remedies on the now common and fatal neurodegenerative illnesses, as well as the reasons why physicians and those who are affected are turning to them as their primary treatment option.

Diosmin is a plant-based drug. In order to increase blood circulation and relieve certain issues, it is now frequently advised to use microcirculation supplements, lotions, and ointments. Diosmin is a naturally occurring substance that is a member of the class of bioflavonoids, sometimes referred to as flavonoids, which are plant substances that have anti-inflammatory, antioxidant, and microcirculatory protective properties that provide the body with a number of positive effects. Large amounts of this flavonoid are found in nature mostly in citrus fruits, such as oranges, grapefruits, and tangerines, as well as in several shrubs, including *Barosma betulina* and *Ruta graveolens*. Diosmin has been used extensively as a treatment for a variety of issues since the late 1960s, including varicose veins, swollen legs, haemorrhoids, and many more[20, 28-31].

Because of their numerous beneficial effects on the human body, bioflavonoids are the focus of ongoing research. Specifically, a large number of research have validated the advantages of diosmin, which works as an anti-inflammatory

and antioxidant, as well as an anti-hyperglycemic, anti-mutagenic, and anti-ulcer agent. According to additional studies, diosmin that has been micronized—reduced to minuscule micrometer-sized fragments—had a beneficial impact on lymphatic drainage, microcirculation, and, indirectly, venous tone[30].

Key characteristics of diosmin:

- **Antioxidant action:** this bioflavonoid has demonstrated efficacy in assisting in the neutralisation of free radicals and lowering oxidative stress, a change that results in a number of harms, including early cell ageing.
- **Anti-inflammatory action:** Diosmin is thought to have anti-inflammatory properties that reduce the levels of so-called inflammatory markers when the human body experiences inflammation, which may be identified by suitable blood tests.
- **Beneficial effects on microcirculation, lymphatic drainage, and venous tone:** Diosmin helps to improve lymphatic flow, decrease intra-lymphatic pressure and lymphatic vessel diameter, protect microvascular permeability (microcirculation includes arterioles, metarterioles, capillaries, and venules), and increase venous tone by extending the action of a specific hormone called noradrenaline. Furthermore, diosmin is utilised in conjunction with other flavonoids, such hesperidin, to improve therapeutic benefits and address a variety of issues.

Diosmin's advantages make it a perfect component for both internal and exterior products, including medications and supplements, as well as ointments, lotions, and gels that are applied directly to the skin. These preparations are primarily advised for the prevention of cellulite, water retention, swollen legs, varicose veins, haemorrhoids, and capillary fragility. Among the most widely used diosmin products are: Diosmin Expert Omniven 500 is one of several medications and supplements for microcirculation, haemorrhoids, and lymphatic drainage that are based on micronised diosmin (typically in combination with other flavonoids and extracts including hesperidin, butcher's broom, and horse chestnut). To encourage absorption of the active component, apply gels and lotions for swollen, heavy legs and fragile capillaries with a light massage. creams and ointments for haemorrhoids, which help lessen swelling and itching and treat haemorrhoidal problems. creams for couperose and dark circles, which could lessen the issue[20, 30].

Supplements based on diosmin and hesperidin (in tablets with 450 mg of diosmin and 50 mg of hesperidin) are frequently advised in cases of impaired microcirculatory function. The suggested dosage is one or two 500 mg pills per day, and the duration of supplementation should normally not exceed three months, though the doctor should make that decision. It is also essential to take care of one's food in order to boost the intake of this flavonoid. As was already established, several fruits in the Citrus genus—also referred to as citrus fruits—contain diosmin. Oranges, lemons, grapefruits, and mandarins are consequently given the green light, particularly if they are in season, fresh, and untreated. Although extremely uncommon, possible diosmin side effects include headaches, diarrhoea, stomach pain, and abdominal pain. Although the active ingredient has no specific contraindications, some research (such as Pharmacokinetic interaction of diosmetin and silibinin with other drugs) indicates that it may interact with anticoagulants, anticonvulsants, and anti-inflammatory medications. In fact, it seems that the flavonoid may reduce the absorption of these medications' active components. Therefore, it is best to consult your physician before taking any diosmin-containing medications or supplements[20, 30].

Diosmin has been the subject of numerous in vitro and in vivo investigations, which have shown its good effects on microcirculation, antioxidant properties, and anti-inflammatory properties. Naturally, it is a good idea to speak with your doctor before taking any dietary supplement, including flavonoid supplements, to prevent any potential conflicts with other medications or supplements. There are several illnesses for which herbal remedies have been studied for therapeutic purposes, and the results have been very encouraging. As a result, further research is required to determine whether herbal remedies can be used as synthetic drug substitutes or in combination with synthetic drugs. We believe that our editorial will be useful in encouraging this line of inquiry[20, 23, 32-37].

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