



A Review Article of Berberine on Syndrome X

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ABSTRACT

A group of conditions that increase the risk of heart disease, stroke and diabetes. MetS (Metabolic Syndrome) is known as Syndrome X. What is Berberine? Berberine also called BBR is the Major Component of *Berberis vulgaris*. Cardiovascular disease (CVD) represents a significant health burden worldwide. An alternative to synthetic drugs because of their potential side effects. *Berberis vulgaris* (*B. vulgaris*) and its active component berberine (BBR) have been extensively studied and have been shown to have various pharmacological activities such as antidiabetic, antiobesity, antihypertensive and hypolipemic properties. Disease can be defined as a health condition that has a clearly defined reason behind it. Syndrome may produce a number of symptoms without an identifiable cause. A syndrome refers to a group of symptoms, while a disease refers to an established condition. They don't have a clear cause, course, or treatment path. A disease is a disorder that affects how your body functions and is more likely to have a known cause, a distinct course, and established treatments. This review suggests a Therapeutic role for Berberine in the management of MetS.

Keywords: Berberine, Hypertension, Stones, Diabetes and CVD.

1. Introduction -

Scientific Name :- *Berberis vulgaris* L.

• **Family:- Berberidaceae**

• **Common names :-**

Barberry,

European barberry

Simple barberry

CONSTITUENTS

Chemical Constituents:-

- **Berberine**(Alkaloids)
- Palmatine
- Berbamine
- Vitamin and Iron(immunity and cure scurvy)
- Citric acid(astringent) and Malic acid.

Parts :-

- Leaves
- flowers
- fruits
- Stem bark



Fig1.1

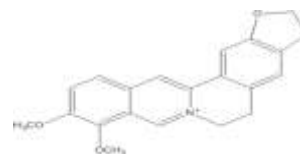


Fig 1.2

- Roots

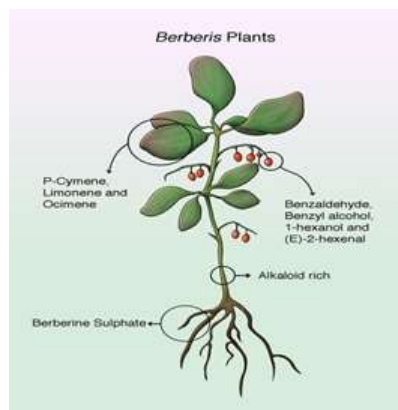


Fig1.3

Dried leaves and stem bark are used to treat edema and hypertension, respectively.

In regards to the gastrointestinal system, the dried root

is employed as a laxative, choleric, and anti-diarrheal, as well as possessing anti-hemorrhoid, anti-hepatitis, and anti-dysmenorrhea properties.

Meanwhile, the fruit is used to treat painful menstruation, hepatic dysfunction, and whooping cough

Alkaloids

An Basic Organic compound containing atleast one Nitrogen group which is useful in its various and diverse Pharmacological activities

Like,

Antibacterial

Antimiotic

Antibacterial

Antiviral

Anti inflammatory

Analgesic

Stem and Root	Protoberberine Alkaloids Isoquinoline alkaloids Bisbenzyliso quinoline alkaloids
Fruits	Anthocyanins Carotenoids vitamins
Flowers	Polyphenolic flavonoids lipids proteins
Leaves	Acids Phenolic compounds

Tab 1.1

Uses:-

- Malarial Fever & cough

- Liver disease
- Laxative & sedative
- Hyperlipidemia
- Hyperglycemia and bleeding
- Kidney stones and UTI
- Over 500 plants from genus *Berberis* are accessible to people across the world with four pharmaceutical organs being used to treat different diseases.

2. History Of Berberine on Metabolic Syndromes :-

Many parts of the plant, such as roots, fruits, and leaves, have long been used in traditional medicine. For example, dried leaves and stem bark are used to treat edema and hemorrhage. For the gastrointestinal system, the dried root is used as a laxative, choleric and laxative and anti-hemorrhoid, anti-hepatitis and anti-menstrual pain symptoms. Currently, the fruits are used to treat painful menstruation, liver disease and whooping cough .

The 21st century must focus on current and future trends in cardiovascular disease. As a result, preventive strategies should be implemented to reduce the burden of CVD in the future. Currently, for the management of chronic diseases such as metabolic syndrome, there is a growing demand for plant biomaterials instead of synthetic drugs to prevent side effects. In addition, traditional medicinal plants is cheaper the Persian word for *Berberis vulgaris* (*B. vulgaris*), which is called "zereshk" It is widely cultivated in Iran, especially in the cities of Birjand and Qaen, in central and southern Europe, and in northeastern America.

The fruit of *B. vulgaris* is elongated and curved, half an inch long and bright scarlet. For example, dried leaves and stem bark are used to treat edema and hemorrhage. For the gastrointestinal system, the dried root is used as a laxative, choleric and laxative and anti-hemorrhoidal, anti-hepatitis and pain reliever. Currently, the fruit is used to treat painful menstruation, liver disease, and whooping cough. Previous studies have shown that *B. vulgaris* has many medicinal properties, such as antihyperglycemic, antioxidant, hyperlipidemic, anticancer, antipyretic, antihistaminic, antibacterial, hypnotic, and activity-reducing effects on jumping and walking. In ancient times, this plant was used in Ayurvedic and Oriental medicine. *B. vulgaris* contains several isoquinoline compounds, including berberine (BBR) and acanthin and vargustanin. Secondary metabolites in the substance include esculetin, ascorbic acid, caffeic acid, pectin and tannin, as well as berbamine, berlambin and palmatine, as documented in the sources. BBR is a type of isoquinoline alkaloid that has been used medicinally, goals over a long period of time. This is the main active component of *B. vulgaris*, as confirmed by studies. BBR has been found to have several pharmacological benefits such as anti-inflammatory, antioxidant, anti-tumor, anti-diarrheal and antimicrobial activities. In addition, it has a wide range of therapeutic uses, such as regulating blood lipids, lowering blood sugar and improving insulin

3. Marketed preparation and Method of preparation :-

Mother Tincture preparation (3.1 and 3.3) Tablets Extract Fluids Tea preparation	 Fig 3.1	 Fig 3.2	 Fig 3.3
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MOP:-

In boiling water add 10 to 20 drops of mother tincture (basically made up of extraction of *Berberis vulgaris*).

Drink 3 times a day in a cup of water. (Take on empty stomach)

You have to take it for 3 to 5 months to get great benefits of it.

4.SUMMARY OF MET(S) IN BERBERINE :-

•EFFECTS ON HIGH BLOOD PRESSURE

There is no widely known medicinal plant or a plant called "Berberis vulgaris." However, you can refer to "Berberis vulgaris," and to the well-known barberry tree. Berberis vulgaris contains an active compound called berberine, which has been studied for its potential effects on various health problems, including hypertension.

1. Vasodilation: Berberine can help relax the blood vessels (vasodilation), which can lead to a drop in blood pressure.
2. Endothelial function: It can improve the function of the endothelium (the inner lining of blood vessels), which plays an essential role in regulating blood pressure.
3. Anti-inflammatory: Berberine has anti-inflammatory properties, and chronic inflammation can contribute to high blood pressure.
4. Antioxidant activity: Berberine is an antioxidant and oxidative stress is related to blood pressure. By reducing oxidative stress, berberine can help lower blood pressure.
5. Reduce sodium retention: Some studies show that berberine can help reduce the reabsorption of sodium in the kidneys, which can lead to a decrease in blood pressure. Hypertension is a major risk factor for cardiovascular disease, including myocardial infarction, cerebrovascular disease, heart failure, and chronic kidney disease.

•EFFECT ON KIDNEY AND URINARY TRACT STONES

1. Prevention of calcium oxalate crystallization: Berberis vulgaris or its active compound berberine helps prevent the crystallization of calcium oxalate, a common component of kidney stones. By preventing the formation of these crystals, herbs can reduce the risk of developing stones.
2. Removal of pre-existing stones: Some studies suggest that berberine may play a role in the removal of small calcium oxalate stones. It is thought to work by breaking up the structure of the stone or attaching it to crystals, making it easier to dissolve and disappear in the urine.
3. Vitamin benefits: - Berberis vulgaris has antioxidant properties, which can reduce stress and inflammation. These factors affect the development and growth of kidney stones. By reducing oxidative stress, the herbs reduce the risk of stone formation.
4. Diuretic effect: Berberis vulgaris acts as a mild diuretic and can increase urine production. Increased urine production can help flush out small stones or crystals that form, preventing them from growing into larger stones. It is important to note that the mechanisms of action of herbal remedies such as berberis vulgaris are complex and may involve multiple pathways.

•EFFECTS ON OBESITY

The increasing obesity is associated with a variety of diet-related chronic diseases, including type 2 diabetes, heart disease, stroke, and hypertension. BBR effectively reduced body weight, fasting blood glucose (FBG), postprandial blood glucose (PBG), fasting insulin (FI), and homeostasis pattern assessment (HOMA IR) in obese mice fed a high-fat diet. In one study, female rats were fed a high-fat diet (HFD) for 6 weeks and then treated with B. vulgaris extract (0.2 g/Kg body weight) and vitamin A (12.8 µg/Kg/day) to develop insulin resistance. . .) for two weeks. Vitamins A and B are given together. vulgaris reduced body weight, blood glucose levels, insulin, and retinol-binding protein 4 (RBP4) expression. In a clinical trial involving 80 patients (case and control groups), significant reductions in body weight, TG, and cholesterol were observed in patients who received two capsules (750 mg) of B. vulgaris extract daily for 3 months.

•EFFECTS ON HIGH GLUCOSE LEVEL

T2DM is a serious and complex disease, one of the most common chronic diseases, and independent CVRF. The antidiabetic and hypoglycemic effects of B. vulgaris and BBR have been demonstrated in many clinical, in vivo and in vitro scientific studies. Many human studies support the antidiabetic effects of this plant. Clinical trials focusing on patients with type 2 diabetes have shown that BBR is an effective drug with a different mechanism than metformin and rosiglitazone, and show the relationship between the effect of BBR to increase insulin receptor mRNA and its hypoglycemic effect in humans. In another human study, patients receiving BBR (0.5 g twice daily for 3 months) experienced significant reductions in biomarkers such as TG, TC, and LDL -C.

Causes

<p>Genetic factors-</p> <ul style="list-style-type: none"> - Past history and age related 	<p>Environmental factors:</p> <ul style="list-style-type: none"> - inappropriate diet - lack of physical activity -smoking stress -toxins/drugs
<p>Effects</p>	

<ul style="list-style-type: none"> ❖ dyslipidemia ❖ hypertension ❖ elevated blood glucose ❖ obesity ❖ insulin resistance ❖ oxidative stress ❖ proinflammatory state gut microbiota alterations. 	
Metabolic Syndrome(MetS)	
<ul style="list-style-type: none"> ✓ Cancer ✓ PCOS ✓ Type 2 Diabetes Mellitus ✓ Atherosclerosis ✓ Non alcoholic Steohepatitis 	
Implications	
<ul style="list-style-type: none"> ✓ Cardiovascular disease ✓ Stroke ✓ Neurological and Neurodegenerative disorders 	

Tab. 4.1

5. CONCLUSION :-

Speaking on the review confirms that it is an effective way to cure people suffering from urinary tract infections, kidney stones, diabetes, high blood pressure, etc.

The most useful homeopathic preparation recommended by doctors is mother tincture preparation tablets for stones and urinary tract infection. It also affects insulin resistance factors that improve the diabetic level of the patient, as this review contain tested summary regarding the effect of berberis vulgaris on Metabolic syndrome. It's a slow and steady process, but if you manage your diet and lifestyle, it can improve your overall health. Widespread use of herbal medicines as complementary medicine is gaining popularity worldwide.

Many drugs are derived directly from plants, while others are natural products that have been chemically modified. Original scientific papers published so far have confirmed the pharmacological potential of *B. vulgaris* and its active component BBR

These agents have shown significant antidiabetic, hypolipidemic, antihypertensive, and antiobesity effects in vitro and, to a lesser extent, in clinical trials.

Based on the present review, it can be concluded that *B. vulgaris* is a promising tool for the treatment of various aspects of the metabolic syndrome (MetS), including type 2 diabetes, dyslipidemia, hypertension and obesity, which are associated with cardiovascular diseases.

However, further clinical studies are needed to demonstrate the therapeutic efficacy of *B. vulgaris* and BBR. It's Basically, about how your body react with any disease by the body Immunity and overall function of body. The total body function depends on the lifestyle and diet etc.

Hence, by improving the diet and consuming healthy foods can make human being improve their disease conditions and cure it by the herbal preparation. As just avoiding the junk food and taking well balanced diet.

6. FUTURE SCOPE:-

The review article on the effects of Berberine on metabolic syndrome show several important findings and implications:

1. Potential Therapeutic Benefits: It has been associated with improvements in blood glucose regulation, insulin sensitivity, lipid profiles and blood pressure control.
2. Antioxidant and anti-inflammatory effects: Berberine found in *Berberis vulgaris* has antioxidant and anti-inflammatory properties that are important for reducing the chronic low-grade inflammation often associated with metabolic syndrome.

3. Weight management: Some studies show that berberine can promote weight loss or prevent excess weight, which is an important factor in metabolic syndrome.
4. Gut microbiota modulation: Berberine has the potential to positively influence the gut microbiota, which plays a role in metabolic health.
5. Complementary treatment: As part of an integrated approach, *Berberis vulgaris* can complement conventional treatments for metabolic syndrome, potentially reducing the need for multiple medications and associated side effects.
6. Safety and tolerability: *Berberis vulgaris* is generally well tolerated, but individual reactions may vary. Clinical supervision is recommended, especially if used with other drugs.

Although these findings are promising, further research is needed to confirm the effectiveness of *Berberis vulgaris* in the treatment of metabolic syndrome and to determine the most appropriate dosage and treatment. People with metabolic syndrome should consult their healthcare professionals before using herbal products such as *Berberis vulgaris* in their treatment plan.

Allopathy affects the specific affected organ or part of the body, but there is always the risk of side effects and infections spreading to adjacent parts of the body. Homeopathy is generally risk-free because it does not affect other parts of the body and aims to heal the whole body, not just the affected part.

Medicines can harm the liver by directly damaging liver cells (hepatocellular), by blocking the flow of bile from the liver (cholestatic), or by doing both. That is why health care providers and doctors recommend homeopathic remedies the most.

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