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CHOLESTRIN GRANULES SHOWS LIPID LOWERING ACTIVITY

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ABSTRACT

Obesity is one of the most common health problems and this disorder is associated with abnormal levels of blood lipids (hyperlipidemia) and lipoproteins (hyperlipoproteinemia). In hyperlipidemic conditions, the levels of lipids and cholesterol elevated in the blood and it is a symptom of different disorders of lipoprotein metabolism.

When abnormally high levels of lipids (fatty substances) are found in the blood, this condition is known as hyperlipidemia. Obesity is also related to this disorder. Hypolipidemic drugs are extensively used to prevent such disorders, but these drugs have other adverse effects. In India about 150 medicinal plants have been used as herbal drugs against these disorders. We focused cholestrin granules which have lipid lowering activities.

Keywords: Hyperlipidemia; Medicinal plants; Obesity; Lipid, CVD: Cardio Vascular Disease; TC: Total Cholesterol; LDL-C: Low Density Lipoprotein Cholesterol; VLDL-C: Very Low-Density Lipoprotein Cholesterol; TAG: Triglycerides; HDL-C: High Density Lipoprotein Cholesterol

1. Background :

Obesity is one of the most common health problems and this disorder is associated with abnormal levels of blood lipids (hyperlipidemia) and lipoproteins (hyperlipoproteinemia). In hyperlipidemic conditions, the levels of lipids and cholesterol elevated in the blood and it is a symptom of different disorders of

lipoprotein metabolism **[1]**. Hyperlipidemia is a condition of excess fatty substances called lipids, largely cholesterol and triglycerides in the blood. The extra amount of lipid circulates in blood attached to the protein and this condition is known as hyperlipoptoteinemia. During the circulation the fatty substances remain dissolved **[2]**. It is a disorder of lipid metabolism caused by elevation of plasma concentrations of the various lipid and lipoprotein fraction, which are the key risks factors for cardio vascular disease (CVD). It also increases the cholesterol esters, phospholipids or triglycerides. Predisposition to coronary, cerebrovascular and peripheral vascular arterial diseases are the most common reason of death in developing and developed nations and they are mostly due to abnormalities in plasma lipids **[3]**. Hyperlipidemia, specially characterized by alterations occurred in serum lipid and lipoprotein profile this is because of increased concentrations of TC, LDL-C, VLDL-C, and TAG with a decrease in the concentrations of HDL-C in the blood circulation **[4]**. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. About 2500 species are present in India and 150 species are used commercially at the large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world **[5]**. A healthy diet that includes fruits, vegetables and legumes along with regular exercise program is helpful in cardiovascular diseases **[16]**. Hence the review study is concluded that the Ayurveda drug possesses antihyperlipidemic activity. In this article we have conclude Cholestrin granules as lowering cholesterol in body with reference of previous work done.

2. Name of Herbal Combination

Cholestrin Granules

3. Manufacturer :

Ayushakti Ayurveda Pvt Ltd pharmacy, Plot number 78, Stice, Musalgaon, Sinnar, Nashik- 422112

4. Herbal formulation

Sr. no.	Sanskrit name	Latin name	Part used	qty in g
1	Isabgol	*Plantago ovata*	Husk	70.00
2	Jirak	*Cuminum cyminum*	Seed	5.00
3	Chitrak	*Plumbago zeylanica*	Root	10.00
4	Dhanayak	*Coriandrum sativum*	Seed	4.00
5	Kokum	*Garcinia indica*	Fruit	3.14
6	Trikatu	*Zingiber officinale* Rhizome, Piper Longum Fruit, *Piper nigrum* Fruit	Fruit	1.02
7	Amalaki	*Emblica officinalis*	Fruit	4.00

5. Isabgol

Isabgol in English is known as Psyllium Husk, the main ingredient in Metamucil (A supplement of fiber that reduces Constipation).Native to Asia, North Africa, and the Mediterranean region, Psyllium Husk also helps clear out toxins from the digestive stretch **[7]**.

Isabgol originated from Sanskrit words 'Asp' and 'Ghol' that together mean horse flower. Some of the synonyms of Isabgol are Psyllium Husk, Umto, and Ashwakarna. In Ayurveda, Isabgol is used to treat problems associated with constipation and is known as traditional medicine. Generally, Isabgol has overpowering, astringent, cooling properties. It reduces the digestive tract's inflammation, alleviates constipation & haemorrhoids and balances the three senses of humorvata, pitta and kapha. It may initially cause gas, but isabgol is rich in fiber as well. How Isabgol improves Heart conditions: Study shows that diet with rich water soluble fibers reduces triglyceride levels. Isabgol reduces the risk of heart condition by adding food items rich in fiber, including psyllium enriched cereals to your diet routine. It further helps in strengthening the heart muscle, reducing blood pressure and enhancing lipid levels.

The mechanism of cholesterol lowering by psyllium is believed to lie in the ability to modify the enterohepatic circulation of bile acids, increasing bile acid synthesis and diverting hepatic cholesterol to bile acid production. This is in line with the additive effect observed when combined with statin therapy, which inhibits cholesterol synthesis directly in the liver through 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibition. The observed percentage of LDL-C lowering achieved by adding psyllium to statin in this study is in the general ballpark of that reported for doubling the dose of most statins (ie, approximately 6%) **[8]**.

6. Jirak:

The scientific name of Cuminumcyminum L. (cumin) referred to as CuminumodorumSalisb, Cuminiacyminum J.F. Gmel, Cuminumhispanicum Bunge, Ligusticumcuminum (L.) Crantz and belonging to the Apiaceae family **[9]**.

Traditional uses of cumin include reducing inflammation, increasing urination, preventing gas and suppressing muscle spasms. It is also used as an aid for indigestion, jaundice, diarrhea, and flatulence, poultice and suppository, and has been taken orally.Pharmacology uses of Cumin and its active constituents used as an antibacterial, antifungal, anti-inflammatory, antioxidant, astringent, atherosclerosis (hardening of the arteries), blood thinner, bone loss, cancer,

cardiovascular disease, carpal tunnel syndrome, cataracts (eye disease), cavities, dental plaque, diabetes, digestion, diuretic (improves urine flow), ear infections, food uses (flavoring and preservative), gas, gastrointestinal disorders, general health maintenance, general stimulant, high cholesterol, immune modulation (affects the immune system), insect repellent, insecticidal, low blood sugar, menstrual flow stimulant, promoting flow of breast milk, relaxation, seizures/epilepsy, ulcers, weight loss **[10]**.

Cumin has a distinctive strong flavour. Its warm aroma is due to its essential oil content. Its main constituent of aroma compounds are cuminaldehyde and cuminic alcohol. Other important aroma compounds of roasted cumin are the substituted pyrazines, 2-ethoxy-3-isopropylpyrazine, 2-methoxy-3-sec-butylpyrazine, and 2-methoxy-3-methylpyrazine. Other components include γ-terpinene, safranal, *p*-cymene, and β-pinene.

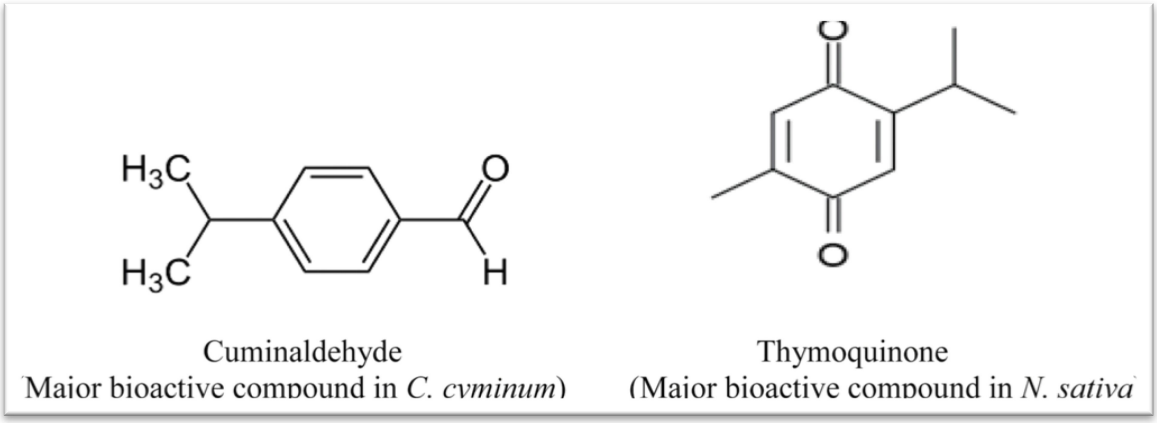

Figure 1: Major bioactive compounds of cumin and black seeds

Mechanism of Cumin:

Paraoxanase-1 plays a protective role against the oxidative modification of plasma lipoproteins and hydrolyzes lipid peroxides in human atherosclerotic lesions. Flavonoids present in cumin seeds are recognized to have antioxidant activity and improve the antioxidant system. A study demonstrated that cumin extract significantly decreased the level of oxidized Low-density lipoprotein (OxLDL) while increasing the activities of paraoxonase, and arylesterase activities were increased in serum which shows cholesterol lowing effect in body.

7. Chitrak

Plumbago zeylanica is a medicinal plant belonging to Plumbaginaceae family. It is commonly known as Chitrak. It's all parts are used but roots contains the most bioactive compound, Plumbagin which exhibit a wide spectrum of biological and

pharmaceutical activities such as anti-malarial, anti-obese, anti-ulcer, anti-microbial, anticancer, anti-inflammatory, antioxidant etc. The roots of *Plumbago zeylanica* and introduced in the hyper-lipidemic rabbits which reduces serum cholesterol and LDL- Cholesterol by 53 to 86% and 61 to 91% respectively. Plumbagin prevents the accumulation of cholesterol and triglycerides in liver and aorta. The administration of 500mg/kg of ethanolic extract of *Plumbago zeylanica* (roots) for 60 days with normal diet to hyper-lipidaemic rabbits significantly reduced the serum cholesterol, LDL, cholesterol and triglycerides and the reduction was almost double in total cholesterol and LDL cholesterol when it is given in combination with Vitamin E and triglyceride level was markedly reduced **[11]**.

8. Dhanyaka:

Coriandrum sativum family Umbelliferae is highly reputed ayurvedic medicinal tree commonly known as the Dhanyaka. It is small sized tree growing throughout India, Italy. Netherlands, Central and Eastern Europe, China and Bangladesh. The different parts of this plant contain monoterpenes, α-pinene, limpnene, γ-terpinene, p-cymene, borneol, citronellol, camphor, geraniol, coriandrin, dihydrocoriandrin, coriandronsA-E, flavonoids and essential oils. Various parts of this plant such as seed, leaves, flower and fruit, possess Diuretic, Antioxidant Activity, Ant-diabetic Anti-convulsant activity, Sedative Hypnotic Activity, Anti-microbial Activity, Anti mutagenic, Anthelmintic activity **[12]**. Coriander seed increases the activity of HMG-CoA reductase enzyme, and there is an increase in the levels of faecal output of total bile acids and neutral sterols. The coriander seeds show significant influence on the metabolism of lipids, decrease in triglycerides & LDL, while an increase in HDL.

9. Kokam:

Kokum (*GarciniaIndica choisy*) is an ancient fruit that is widely consumed in the form of sarbat. Kokum is a fruit tree of culinary, pharmaceutical, nutraceuticals and industrial uses. Kokum has a long history in Ayurvedic medicine as it was traditionally used to treat sores, dermatitis, diarrhea, dysentery, ear infection, and to facilitate digestion. Kokum seeds are used for oil extraction. That oil is called kokum butter and used in curries, cosmetics, medicines, and costly confectionery preparations in foreign countries. The kokum fruit acts as an anti-oxidant, acidulant and appetite stimulant and helps in fight cancer, paralysis and cholesterol. It suppresses fatty acid synthesis, lipogenesis

and food intake and induces weight loss. Garcinol, a polyisoprenylatedbenzophenone purified from G. indica fruit rind, displays antioxidant, anti-cancer and anti-ulcer properties **[13]**.

10. Trikatu:

Trikatu, as per Ayurveda's Bhaisajyaratnawali is a compound herbal formulation containing three bitter herbs mixed together in equal quantities. Dried fruits of Piper nigrum (Maricha) and Piper longum (Peepli) and dried rhizomes of Zingiberofficinale (Sunthi) are used to prepare this miraculous formulation. It is prescribed in Ayurvedic system of medicine for treatment of tastelessness, digestive impairment, and diseases of nose and throat such as chronic rhinitis/sinusitis, skin diseases, asthma, cough, frequent urination, obesity, and Filariasis. Trikatu is also added in various Ayurvedic formulations with a view to restore the disturbed "tridoshas- vatta, pitta and kapha." It calms down the increased Vata and Kapha and increases the Pitta. It has pungent (katu) taste, hot (ushna) potency, light (laghu) and dry (ruksha) quality, and digestive (amapachaka) therapeutic effect. Trikatu also possesses immunomodulatory, antiviral, expectorant, carminative, hypolipidemic, hypoglycemic, antiemetic, and anti-inflammatory potential **[14]**.

11. Amalaki:

Amla (Indian gooseberry) is one of the most important medicinal plants in Indian traditional systems of medicine. The plant is botanically identified as *Phyllanthus emblica* Linn. Or *Emblica officinalis* Gaertn. It is a small or medium sized, deciduous tree. Leaves are sub sessile, closely set along the branchlets, distichously narrow, linear, and obtuse, having appearance of pinnate leaves. Flowers are greenish-yellow, arranged in axillary fascicles on the leaf bearing branchlets, often on the naked portion below the leaves. Fruits are fleshy, globose, with obscure vertical furrow, pale yellow.

Amla fruit has been mentioned under triphala (~combination three potent fruit) along with bibhitaki (*Terminalia bellirica* (Gaertn.) Wall.) Andharitaki (*Terminalia chebula* Retz.) in Ayurveda. This fruit is widely used in the Indian system of medicine as alone or in combination with other plants and is used to treat common cold and fever, as diuretic, laxative, liver tonic. Amla is helpful to lower triglyceride levels of the body also known as bad cholesterol. This helps to stay at a bay from health issues like heart ailments, high cholesterol, high blood sugar, and unwanted fats of the body. Amla is also filled up with vitamin C hence people with high blood sugar and high cholesterol

levels should regularly have Amla.

RESULT:

We conclude that Cholestrin Granules helps in lipid lowering in obese patients. All these activities directly or indirectly influence the cellular and body metabolism and play favourable roll in blood circulation.These studies highlight alternative therapeutic approaches in the form of Ayurvedic medicine to manage hypercholesterolemia and cardiovascular complications with minimum adverse effects.

DISCUSSION:

Hyperlipidemia is related to cardiovascular disorder and obesity. Hypolipidemic drugs are extensively used to prevent such disorders, but these drugs have other adverse effects. However, due to adverse side effects, there is a demand for new compounds for the treatment of hyperlipidemia. The potency of herbal drugs is significant and they have negligible side effects than the synthetic hypolipidemic drugs. Patients demand these natural products due to their hypolipidemic activities. This review acts as a ready reference for the scientific community, in specific to researchers and students looking for sources of knowledge on medicinal plants that leads for new bioactive compounds and develops an increased interest in these medicinal plants. Here we can conclude that Cholestrin granules work as lipid lowering human body with minimum adverse effect.

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