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Antihyperlipidemic activity of *Commiphora mukul*: A review

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Abstract

Disorders of lipoprotein metabolism are collectively referred to as “Dyslipidemias”. Most of the Dyslipidemias are Hyperlipidemias Cardiovascular disease is the leading cause of morbidity and mortality world-wide, which is an important risk factor for cardiovascular diseases. Therapies aimed at lipid modification are important for the reduction of cardiovascular risk. Pharmacological management in conventional medicine includes statins and fibrates or both. The statins and fibrates have side effects such as myalgia, myositis, rhabdomyolysis, dyspepsia, renal failure and cholelithiasis etc. In Unani medicine a large number of single and compound drugs are being used in the treatment of Obesity. Experimental and clinical studies of some of these drugs revealed hypolipidemic, antioxidant and cardioprotective properties This review discusses the antihyperlipidemic activities of the *Commiphora mukul*.

Keywords: Dyslipidaemia, *Commiphora mukul*

Introduction

Disorders of lipoprotein metabolism are collectively referred to as “Dyslipidemias”. Most of the Dyslipidemias are Hyperlipidemias ^[1]. Muqil (*Commiphora mukul*) has been used in herbal medicine for centuries for various ailments. In recent years gugul has been the focus of serious medical and clinical attention because of beneficial effects on several cardiovascular risk factors like reduction of serum lipids, blood pressure and plasma viscosity ^[12]. A large number of clinical trials have been conducted to evaluate the hypolipidemic effect of guggulipid. Most of these studies were carried out in India and one in the United States. Consistent with the preclinical data, most of these studies demonstrated hypolipidemic activity of guggul or guggulipid with an average of 10.30% and 10.20% decrease in total cholesterol and triglycerides, respectively ^[9]. The ethyl acetate extract of this gum resin, designated guggulipid, has since been shown to exhibit lipid-lowering activity in normal and hyperlipidemic rats, rabbits and monkeys ^[2] Recent clinical analysis revealed that the isomers E- and Z-guggulsterones are responsible for the hypolipidemic activity of gum guggul ^[3]. In various experimental and human studies, *Commiphora mukul* has shown to decrease atherosclerosis, lower serum cholesterol and triglycerides (TGs), and also increase HDL and cholesterol ^[4-6]. In one study guggulsterone, 25 mg/kg p.o., lowered serum cholesterol and triglycerides by 27% and 30%, respectively, after a treatment period as short as 10 days ^[7]. The largest clinical trial with 205 hypercholesterolemic or hypertriglyceridemic patients was conducted in 1989, Patients were treated with 500 mg guggulipid daily for 12 weeks, total serum cholesterol and triglycerides decreased by 24% and 23%, respectively. It should be mentioned that such hypolipidemic effects were observed in 70–80% patients ^[8]. 125 patients were treated with guggulipid at 500 mg daily for 12 weeks, At the end of the study, guggulipid significantly decreased total serum cholesterol by 11% and triglycerides by 17%. The beneficial effects of guggulipid became evident within the first 3–4 weeks of the study. In addition, HDL level was increased in 60% of the responders to guggulipid therapy. The study clearly demonstrated the benefits of guggul therapy in reducing cholesterol and lipid levels in hypercholesterolemic and hypertriglyceridemic patients ^[9]. A randomized controlled double-blind trial was conducted in 1978. A total of 120 patients with hyperlipidemia were enrolled in the study. Gum guggul at 2g twice daily or fraction “A” extract at 500 mg three times daily for 21 days significantly reduced the serum lipid levels in hyperlipidemic non-obese patients ^[10]. A clinical trial that was first published in Western literature in 1994. Patients received guggulipid 50 mg twice daily for 24 weeks, followed by a 12-week washout period. Guggulipid reduced total cholesterol levels by 11.7%, LDL by 12.5%, and triglycerides by 12%, whereas a 3.5% reduction in total cholesterol ^[11].

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The purpose of present review paper was to evaluate the effects of gugul on hyperlipidemia. The Framingham Heart Study was one of the first to observe the inverse correlation between HDL-C and coronary risk, the higher the HDL-C, the lower the risk for an event, to the extent that a 1-mg/dl increment in HDL-C corresponded with 1% decrement in CHD risk [13].

Mechanism of Action: The active ingredients responsible for the use of the plant in maintenance of healthy cholesterol levels is guggulsterone specifically guggulsterone E and guggulsterone Z. The mechanisms implicated for lipid-lowering effect of guggulipid are stimulation of hepatic lipases and receptor mediated catabolism of low-density lipoproteins, and suppression of hepatic cholesterol biosynthesis. Guggulsterones inhibited cholesterol synthesis in the liver via antagonism of the farnesoid X receptor and the bile acid receptor [14]. Guggulsterone [4,17(20)-pregnadiene-3,16-dione] (Fig. 1), the active component of guggulipid, is derived from the gum resin of the tree *Commiphora mukul*, and has cis- and trans- isomers [15].

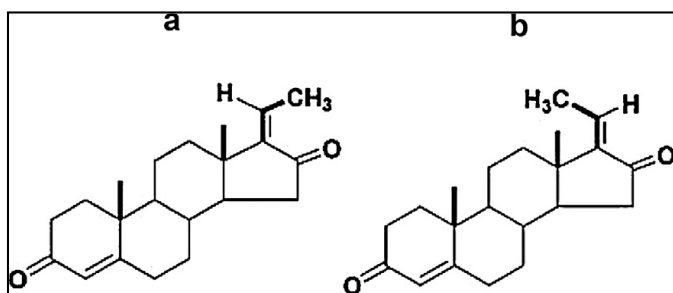


Fig 1: Chemical structures of guggulsterone. (a) Z-guggulsterone; (b) E-guggulsterone.

Brief Drug Review [16]



Fig 2: Mukul

Commiphora mukul is about 1.2-1.8 meter high plant. It belongs to Burseraceae family. The plants mainly grows wild in the arid, rocky tracts. The worldwide geographical distribution of mukul is South Africa, mid Asia, in India mainly found in Rajasthan, Karnataka and also found in the forest of Maharashtra. Gum resin is used for the medicinal purpose.

Lattin Name: *Commiphora mukul*

Family: Burseraceae

Arabic and English names: Qafar, Mukul-e- Yahoood, Mukul arzaq (Arabic), Indian Bedellium (English) [17].

Part used: Gum resin

Medicinal properties: Astringent, Antiseptic, Demulcent, Anti-inflammatory, Lithotriptic, Aphrodisiac,

Chemical Constituents: Mukul contains variety of **Phytochemicals** like *Flavonoid, Terpenes, Phytosterols* [19].

Guggulipid: (Contains main active substance i.e *Guggulsterols*) [18].

Dosage: 3-7 gm

Conclusion

The purpose of present review paper was to evaluate the effects of gugul on one of the major cardiovascular risk factors i.e. dyslipidemia. The *Commiphora mukul* have emerged as a good source of the traditional medicine, used for the treatment of obesity and dyslipidaemia. Dyslipidas. The further more comprehensive clinical trial are needed to established the antihyperlipidemic activity of the *Commiphora mukul*.

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