HERBCLIP™

FILE: • Hawthorn (Crataegus spp.)
  • LDL cholesterol
  • Hypercholesteremic effect

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RE: Hawthorn Berry Tincture Lowers LDL Cholesterol in Rats


Although ABC seldom reviews pharmacological studies on animals in HerbClip™, and although this study is relatively old, nevertheless this study suggests that the increasingly popular herb hawthorn, used primarily for its cardiotonic effects, may also be useful as a potential cholesterol-lowering agent. The most researched hawthorn preparations are derived from extracts of the leaves and flowers, although this study was conducted on the berries [fruit].

Tincture of Crataegus is an alcoholic extract of the berries of hawthorn (Crataegus oxyacantha) that is widely used in Western Europe as a heart tonic. In rats it has remarkable hypocholesterolemic effects. Total and LDL cholesterol concentrations in the plasma depend on the rate at which LDL is taken up by various tissues. The liver is of particular importance. The objective of this experiment was to study the hypocholesterolemic mechanism of action of hawthorn tincture.

In this study, rats were divided into 3 groups. For six weeks one group received a normal diet, the second group received an atherogenic diet (a diet that tends to increase production of LDL cholesterol and arterial plaque buildup), the third group was given the atherogenic diet plus 0.5 mg/100g body weight of oral tincture of crataegus. At the end of 6 weeks the animals were sacrificed. Cholesterol in plasma, liver, and lipoprotein fractions were measured. Liver cholesterol synthesis was assayed and bile acids were estimated.

The atherogenic diet caused a dramatic increase in total cholesterol, lipoprotein cholesterol, and the atherogenic index. Hawthorn tincture significantly (p<0.001-0.0001) prevented the increase in the aforementioned parameters. The atherogenic diet also increased liver total cholesterol, depressed cholesterol biosynthesis and increased hepatic and fecal bile acid content. Hawthorn tincture treatment prevented cholesterol accumulation in the liver, en-
hanced bile acid content of liver and feces, and depressed hepatic cholesterol biosynthesis. There was a significant increase in the number of LDL binding sites in the liver plasma of rats eating the atherogenic diet and taking hawthorn tincture.

There was a 25% increase in LDL-receptor activity in the rats fed an atherogenic diet. This may be caused by the body attempting to maintain plasma LDL concentration at lower levels by increasing cholesterol influx in the liver. However, these compensatory mechanisms were inadequate under conditions of cholesterol loading for 6 weeks. As a result, plasma LDL-cholesterol increased by 104% and liver cholesterol increased by 231% in the rats fed an atherogenic diet.

Hawthorn tincture may lower plasma and LDL cholesterol and liver cholesterol by increasing the influx of plasma cholesterol into the liver through an increase in hepatic LDL-receptor activity. It also maintained the hepatic demand for cholesterol at a higher level by enhancing cholesterol catabolism to bile acids. Bile acids are derived from hepatic cholesterol synthesized de novo and from plasma lipoprotein cholesterol. Hawthorn tincture suppressed hepatic cholesterol synthesis thereby forcing the liver to rely on LDL-cholesterol for bile acid synthesis. This is an important therapeutic effect of tincture of crataegus because bile acid elimination is a significant mechanism for cholesterol removal from the body. —Heather S. Oliff, Ph.D.

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