



a herb for the
HEART

Research shows that supplementation with **Borage Oil may help reduce the risk of cardiovascular diseases**

By Artur Klimaszewski, MD

Cardiovascular diseases are the leading cause of death in the US and around the world. About **40%** of people living in the US eventually die from cardiovascular diseases. The Heart and Stroke Foundation estimates that **58.8 million** Americans currently have one or more types of cardiovascular disease.

The majority of cardiovascular diseases are caused by atherosclerosis – the progressive narrowing of the arteries over time. Atherosclerosis is characterized by a buildup of

fatty deposits, called plaque, on the inner walls of the arteries. This yellowish plaque is made up of **LDL-Cholesterol**, lipids and cellular debris. The buildup of plaque can lead to insufficient delivery of blood and oxygen to vital organs such as the heart, brain, and kidneys, and to the lower extremities. This loss of circulation to the lower limbs can lead to gangrene in diabetics.

Atherosclerosis may also lead to other complications including aneurysm, embolism, and irregular heart beat.

The primary risk factors for atherosclerosis are:

- Elevated blood-cholesterol
- High blood pressure
- Diet high in saturated fat
- Lack of exercise
- Family history of atherosclerosis
- Obesity
- Cigarette smoking
- Diabetes Mellitus

Research with both animals and humans indicates that supplementation with Gamma-linolenic Acid (GLA) can reduce some of these risk factors. GLA is an Essential Fatty Acid that cannot be obtained from the regular diet. It is a naturally occurring compound found in Borage (also known as Starflower) Oil, Evening Primrose Oil, and Black Currant Oil.

GLA has been shown to help correct blood cholesterol levels, lower blood pressure, and may interfere with the growth of atherosclerotic plaque. Supplementation with GLA can therefore be a helpful addition to a “heart healthy” regime.

Effects of GLA on cholesterol

In 1994, a Chilean placebo-controlled human clinical study demonstrated the positive effects of GLA on blood cholesterol.¹ The study included 12 men with increased levels of LDL (“bad cholesterol”) and with a known family history of premature coronary artery disease. The patients received 240 mg of GLA per day. After two months of supplementation, the average LDL-cholesterol level in the treatment group had fallen to a healthy 125 milligrams per decilitre (mg/dl) of blood. The placebo group remained high, with an average of 246 mg/dl. At the same time, the average blood level of the beneficial HDL-cholesterol (“good cholesterol”) increased in the treatment group to 42 mg/dl. The placebo group remained high risk, at 33 mg/dl.

An earlier study, done in 1989 in Japan, showed similar effects.² However, it was observed that some patients did not respond to the treatment as well as others. Therefore, patients with high blood cholesterol who begin tak-

ing a GLA supplement should test their LDL-cholesterol level after approximately 6 weeks to ensure that they are experiencing positive effects.

Animal studies have also demonstrated that GLA inhibits the increase of blood cholesterol due to dietary factors.³

Effects of GLA on high blood pressure

High blood pressure (hypertension) increases blood turbulence and may damage blood vessel walls, leading to the development of atherosclerotic plaque. Several laboratory studies on hypertensive rats have shown that dietary supplementation with oils containing GLA significantly lowered blood pressure.⁴

Studies on humans demonstrate that GLA supplementation lowers stress-related hypertension.

In a 1996 study published in the *Journal of Human Hypertension*, patients received 1 gram of GLA per day for 4 weeks.⁵ During subsequent stress-tests, the blood pressure of the treatment group increased up to 40% less than in the placebo group.

In an earlier study, investigators compared the effects of GLA (Borage Oil) and EPA (Fish Oil) on stress-induced hypertension.⁶ In the 28-day study, one treatment group received 1.3 grams of GLA per day, while the other received 1.6 grams of EPA per day. During subsequent stress-tests, the Borage Oil group demonstrated a lesser stress-relat-

A Quick Guide to Cholesterol

Cholesterol is transported in the blood in association with various protein complexes. These complexes include very low-density lipoproteins (VLDL), low-density lipoproteins (LDL), and high-density lipoproteins (HDL). The majority of cholesterol in the body (60-70%) is transported in the form of LDL, which is the “bad cholesterol” correlated with the risk of heart diseases. HDL cholesterol, or “good cholesterol”, has been shown to play a protective role.

LDL levels less than 130 mg/dl are “desirable”, while 160 mg/dl and over is considered “high”.

HDL-cholesterol levels more than 60 mg/dl are “desirable”, while levels less than 35 mg/dl are “high risk”.

Data compiled from the American Heart Association

ed increase in blood pressure than either the placebo or fish oil groups.

Further effects of GLA on the growth of atherosclerotic plaque

Several studies done on animals or in vitro suggest that GLA may inhibit a number of other processes related to the growth of atherosclerotic plaque including platelet aggregation and smooth muscle cell multiplication.^{7,8}

These findings have yet to be confirmed in human trials.

Getting the GLA you need

The best source of GLA is Borage (or Starflower) Oil, which contains up to 23% GLA. Evening Primrose Oil (8-10% GLA) and Black Currant Oil (15-17% GLA) are other sources of GLA. Because of the higher concentration of GLA in Borage, a patient may consume fewer capsules overall to achieve the required dosage. This allows the patient to consume the least amount of supplemental calories and fat possible and makes Borage Oil the most economical source of GLA.

Effective dosages for lowering blood cholesterol levels are in the range of 250 to 1000 mg of GLA per day, or one to four 1000-mg

capsules of Borage Oil per day. Effective dosages for reducing stress-related blood pressure are in the range of 1000 to 1300 mg of GLA per day, or four to five capsules daily.

The positive effects of GLA can generally be seen after one month of supplementation, although some people might experience the effects much faster. The full effects of GLA supplementation are seen over longer periods.

Studies have shown that Borage oil is safe and non-toxic, even in

large amounts.

For maximum effectiveness, GLA can be taken in conjunction with a regular exercise routine and a diet reduced in cholesterol and saturated fat.

Artur Klimaszewski is an M.D. with Bioriginal Food & Science Corp., Saskatoon, Canada. He is devoted to research in the field of Essential Fatty Acids.

References:

1. Guivernau, M. et al. Clinical and Experimental Study on the Long-term Effect of Dietary Gamma Linolenic Acid on Plasma Lipids, Platelet Aggregation, Thromboxane Formation, and Prostacyclin Production. *Prostaglandins, Leukotrienes and Essential Fatty Acids*, Vol. 51, pp 311-316 (1994).
2. Ishikawa, Toshitsugu, et al. Effects of gamma Linolenic acid on plasma lipoproteins and apolipoproteins. *Atherosclerosis*, Vol. 75, pp 95-104 (1989).
3. Fukushima, Michihiro et al. Comparative Hypocholesterolemic Effects of Six Dietary Oils in Cholesterol-Fed Rats After Long-Term Feeding. *Lipids*, Vol. 32, No. 10, pp 1069-74 (1997).
4. Engler, Marguerite. Comparative study of diets enriched with evening primrose, black currant, borage or fungal oils on blood pressure and stressor responses in spontaneously hypertensive rats. *Prostaglandins, Leukotrienes and Essential Fatty Acids*, Vol. 49, pp 809-14 (1993).
5. Deferne, J-L. Resting blood pressure and cardiovascular reactivity to mental arithmetic in mild hypertensive males supplemented with blackcurrant seed oil. *Journal of Human Hypertension*, Vol. 10, pp 531-37 (1996).
6. Mills, David, et al. Dietary fatty acid supplementation alters stress reactivity and performance in man. *Journal of Human Hypertension*, Vol. 3, pp 111-18 (1989).
7. Charmock, J.S., et al. Gamma Linolenic acid, black currant seed and evening primrose oil in the prevention of cardiac arrhythmia in aged rats. *Nutritional Research*, Vol. 14, pp 1089-99 (1994).
8. Fan, Y-Y, et al. A macrophage-smooth muscle cell co-culture model: applications in the study of atherogenesis. *In Vitro Cellular and Developmental Biology*. Vol. 31, pp 492-93 (1995).

October 1999

© Copyright Bioriginal Food & Science Corp.

May be reprinted in whole or in part with written permission from the corporation.
Address: 102 Melville Street, Saskatoon, Saskatchewan S7J 0R1.
Phone: (306) 975-1166 Fax: (306) 242-3829
Website: www.bioriginal.com

Disclaimer:

This information is provided in good faith as educational material. It is the customer's responsibility to check the suitability of the material under FDA (DSHEA), HPB, and/or any other rules regarding the use of this material. Bioriginal is not responsible for compliance to various rules regarding the use of this literature as promotional material.