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### New Therapy for Varicose Veins

Overseas studies reveal the venotonic properties of horse chestnut extract



More than 80 million Americans, the majority of them women, have varicose veins. This is not just a cosmetic problem, as the appearance of varicose veins can be an early symptom of serious vascular disease.

Earlier this year, a Swiss pharmaceutical company introduced to the United States a popular European herbal drug, horse chestnut, that is virtually unknown to Americans. This pharmaceutical company plans to spend \$7 million advertising this natural therapy to treat a wide range of venous disorders, and promote leg health.

Horse chestnut's action against edema is extraordinarily strong and long-lasting, and 600 times more powerful than rutin.

Horse chestnut is one of the better-validated German herbal medications. Doctors throughout Europe prescribe horse chestnut to treat varicose veins, chronic venous insufficiency and leg swelling. Horse chestnut is the second most popular herb prescribed in Germany, greatly outselling herb extracts such as echinacea and St. John's wort.

One way that horse chestnut functions is to reduce the number and diameter of small pores in the capillary membranes, thus reducing the escape of fluid into the surrounding tissues. This "sealing" effect in the capillaries improves blood flow in the veins, and reduces swelling of small veins in the legs.

A study published in *The Lancet* (Feb 3, 1996; Vol. 347, pp-292-294) examined 240 patients with chronic venous insufficiency that caused severe leg edema (pooling of fluid in tissues).

After 12 weeks on horse chestnut extract, fluid volume of the leg was reduced by an average of 43.8 milliliters, while the placebo group showed an increase of 9.8 milliliters in fluid retention.

Horse chestnut therapy compared favorably with compression stocking therapy, which many people find uncomfortable. Moreover, patients in the horse chestnut group were still improving at the end of the 12-week trial, while the effects of compression therapy leveled off after four weeks.

Another mechanism by which horse chestnut works indicates that it also could have anti-aging effects. In addition to improving circulation, horse chestnut inhibits an enzyme called hyaluronidase that degrades hyaluronic acid, used by skin and capillary cells as part of the proteoglycan "jelly" to hold collagen fibers in place. Horse chestnut inhibits the age-related breakdown of hyaluronic acid, and by doing so stabilizes the support structures for the veins, skin and other connective tissues.

Horse chestnut's action against edema is extraordinarily strong and long-lasting. In addition, it is 600 times more powerful than rutin, according to animal studies.

A clinical trial on 35 patients with chronic venous insufficiency measured the volume of patients' feet while lying down and standing up. Horse chestnut proved highly effective against foot edema in both positions, without depressing potassium levels, as do diuretics. Another study of edema in the leg concluded, "The clinical benefit for the patient is present in all everyday situations (in movement as well as sitting or standing)."

### How Horse Chestnut Protects Veins

The heart pumps blood through the arteries, then into the capillaries, from which it returns through the veins. However, the low pressure in the veins can pose a problem in the legs, where blood must flow upward against the pull of gravity to reach

the heart when a person is standing. Veins have one-way valves to prevent backflow of blood. The muscles of the calf compress the deep veins of the leg, propelling blood upward from the legs, but the superficial veins of the leg are not surrounded by muscles, so blood flows through them more slowly.

The condition of inadequate return of blood from the leg veins to the heart is called venous insufficiency. Physiologically, the basis is elevated blood pressure in the veins of the leg. The main cause is backflow of blood due to malfunction of the valves in the leg veins. In varicose veins, the superficial leg veins lose tone, stretching both lengthwise and widthwise. The elongation of the veins forces apart the valves that normally keep blood from flowing the wrong way, allowing reflux of blood, in a standing position especially. Blood pools in the veins, enlarging them even more. The legs tend to ache dully, feel tired and sometimes itch. There are many theories of how elevated venous pressure leads to edema, skin damage and sometimes ulceration. A widely held theory is that increased capillary permeability leads to leakage of plasma proteins and fibrinogen, forming a "fibrin cuff" around the capillaries. This cuff diminishes blood supply, and the supply of oxygen and nutrients to tissues. Edema and inflammation also result.

The latest research traces these pathological changes to venous stasis-the lack of proper blood flow in the veins. It brings about hypoxia, or diminished oxygen supply. This in turn leads to changes in the cells of the inner blood vessel wall, which then releases inflammatory substances that activate neutrophils. The activated neutrophils adhere to these cells, releasing free radicals and enzymes that degrade the extracellular matrix. A cascade of events follows to bring about pathological changes in the vein walls. The activity of proteolytic enzymes (enzymes that break down proteins) increases, and connective and muscle tissue in the vein wall deteriorates.

Horse chestnut counteracts these pathological processes in many ways. First, it helps restore vein tone, the ability of the vein to contract dynamically to the correct size for any given venous pressure. Secondly, horse chestnut helps correct the increase in capillary permeability. When an inflammatory stimulus is injected into the rat, it increases the permeability of the lympho-plasmatic barrier, doubling the lymphatic flow. Escin, the key active constituent in horse chestnut, counteracts this effect, returning the permeability of the lympho-plasmatic barrier to normal.

Thirdly, horse chestnut inhibits two key steps in the degenerative cascade set off by hypoxia, the decrease in ATP content and the increase in the activity of phospholipase A(2), a proinflammatory enzyme. Moreover, escin inhibits neutrophils from adhering to hypoxic cells on the inside vein wall.

Finally, horse chestnut counteracts the deleterious effects of free oxygen radicals, and helps stabilize connective tissue and preserve the integrity of the extracellular matrix. It inhibits enzymes that degrade proteoglycans, which are essential to the stability and function of connective tissue.

The key active ingredient in horse-chestnut is a substance called escin. Pharmaceutical-grade horse-chestnut extracts contain between 16 and 20 percent escin. The therapeutic dose used in clinical studies is 50 mg of escin taken two times a day. This dose is provided by one 250-mg tablet of horse chestnut extract standardized at 20 percent escin, taken every 12 hours.

#### Most Prescribed Herbal Monopreparations in Germany

Herbal Drug	Retail sales (Millions U.S.)
Ginkgo biloba (circulatory agent)	\$280
Horse Chestnut (venous agent)	103
Yeast (antidiarrheal)	48
Urtica (urologic agent)	33
Crataegus (cardiac agent)	27
Hypericum (antidepressant)	26
Echinacea (immunostimulant)	9
Valerian (sedative)	5

Source: Arzneimittelvergnordnungsreport

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