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Research Article

Combining bromelain and liposomal vitamin C ameliorates drainage in women with venous disease

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Chronic Venous Insufficiency (CVI) is a consequence of macrovascular and microvascular changes in the lower extremities, including basement membrane thickening, capillary bed malformation (with an increased fluid permeability), and endothelial damage [1,2]. In cases of local inflammation, hypoxic damage to endothelial cells augments the local inflammatory process and leads to impairment of endothelial functions [3,4]. There is an hypoxic vulnerability of capillary vessels, and any treatment for CVI or edema should aim to restore normal oxygen levels (normoxia).

The mainstay of treatment for CVI is compressive stockings [1,5], with medical treatments (surgery and thermo and venous ablation and sclerotherapy) and/or pharmacologic therapies prescribed depending on severity [1]. However, a concomitant oral treatment can protect endothelial cells from hypoxic damage, reducing the loss of capillary function. In fact, as indicated by CEAP (Clinical, Etiological, Anatomical, Pathophysiological) Classification, the guidelines suggest the usage of venous anti-inflammatory drugs from C0 to C6.

Bromelain is a mixture of proteolytic enzymes primarily extracted from the fruit and stem of the pineapple plant (Ananas comosus). It has a long history of traditional medicinal use in various cultures, particularly in Central and South America, where pineapple is native[6]. Bromelain exerts its therapeutic effects through a multifaceted mechanism of action, which contribute to the anti-inflammatory, analgesic, anti-angiogenic, and antioxidant properties of bromelain, making it a promising candidate for the treatment of various inflammatory and oxidative stress-related disorders, including CVI. Bromelain exerts its diverse biological effects through multiple mechanisms of action, including proteolytic activity, anti-inflammatory and immunomodulatory effects, fibrinolytic activity, antioxidant properties, and modulation of cell signaling pathways [7]. It is completely absorbed in any forms and has no intestinal degradation problems [8]. For inflammation and swelling, i.e. for CVI treatment, bromelain has been shown to be efficacious at a dosage of 1000 mg per day [9].

Furthermore, vitamin C, an essential nutrient with antioxidant and anti-inflammatory effects, could play an important role in combination with bromelain for treating CVI. Since the absorption of vitamin C is affected by a saturable system that limit its bioavailability , it has been recently developed a novel liposomal vitamin C formulation for oral administration that allows a much effective absorption with higher compliance [10].

These ingredients are generally used as on oral therapy for counteracting inflammation as background anti-inflammatories particularly acting against edema and the inflammatory phases of CVI.

Recently a novel formulation combining these ingredients has been commercialized (Claremase®).

It is so far the only formulation that gives in a single oral administration 1000 mg of bromelain at highest purity (2500 GDU) combined with 500 mg of liposomal vitamin C.

Thanks to this formulation and the high compliance it may represent a new breakthrough therapy for inflammatory disease in CVI.

Further clinical trials on women with CVI will be performed to confirm the efficacy of the combination and can reduce women leg swelling of 30%.

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