Perfusia Summary

Vascular endothelial function is crucial to cardiovascular function and thus to blood perfusion to the heart and throughout the body. A number of substances are produced and secreted by vascular endothelial cells, the most important of which is nitric oxide, a potent regulator of vascular function. Nitric oxide diffuses from endothelial cells into underlying smooth muscle, causing relaxation, which results in vasodilatation. When this process is inhibited or inadequate the arteries cannot dilate as necessary, resulting in hypertonicity and reduced blood flow. Such endothelial dysfunction also causes increased platelet and monocyte adhesiveness and smooth muscles proliferation, processes thought to be the genesis of atherosclerotic plaque formation. Since L-arginine is the body's only substrate for nitric oxide synthesis, adequate L-arginine must be present for proper nitric oxide production.

In this open label trial, a group of 29 asymptomatic individual's were given L-arginine (1,050 mg, as Perfusia SR®, a sustained-release preparation) twice daily (total 2.1 g daily) for one week. Systolic blood pressure was reduced in 62 percent of participants compared to baseline, with a non-significant mean decrease in all patients of 4 mmHg. Diastolic blood pressure was reduced in 69 percent of participants, with a mean reduction of 3.7 mmHg ($p=0.005$). In the 10 individuals who were borderline or hypertensive (systolic >130 or diastolic >85), there was a mean systolic reduction of 11 mmHg ($p=0.05$), while normotensives ($n=19$) had a mean systolic decrease of only 0.22 mmHg. Diastolic blood pressure was decreased a non-significant 4.9 mmHg in borderline or hypertensives and 4.5 mmHg in normotensives ($p=0.026$).

Vascular elasticity relates to endothelial function, and can be measured non-invasively. At baseline and follow-up, vascular compliance was assessed via digital pulse wave analysis (DPA; Meridian Medical). After one week, pulse wave analysis showed a significant increase in large artery compliance (mean 23% improvement; $p=0.02$) and a non-significant increase in small artery compliance (mean 23% improvement; $p=0.15$).

This study demonstrates blood pressure reductions, especially in patients with borderline or frank hypertension, as well as improved vascular compliance – and indicator of improved endothelial function and perfusion – after a one-week trial of sustained-released L-arginine. Poor endothelial function due to inadequate endothelial nitric oxide production is present in hypertension, as well as in numerous other aspects of cardiovascular disease, including angina, erectile dysfunction, cerebrovascular disease, and peripheral vascular disease. This is the first study showing a moderate dose of sustained-release L-arginine can improve endothelial function and blood pressure. (*Altern Med Rev* 2006;11(1):23-29)

SUMMARY

1. L-Arginine is essential to nitric oxide production
2. Nitric oxide is impaired in cardiovascular diseases
3. Regular L-arginine is metabolized too quickly, so large doses must be taken often
4. Perfusia-SR is absorbed slowly, resulting in higher long-term blood levels
5. Most clinical studies have used regular L-arginine, and at much higher doses (6-20 grams daily)
6. Sustained-release L-arginine improves endothelial function at lower dose than non-sustained-release
7. Perfusia-SR improves blood flow to the heart muscle
8. Perfusia-SR improves peripheral blood flow
9. Perfusia-SR lowers blood pressure
10. Perfusia-SR improves vascular elasticity
11. Perfusia-SR improves erectile function

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Clinical Indications

1. Coronary heart disease
2. High blood pressure
3. Erectile dysfunction
4. Diabetes
5. Peripheral vascular disease
6. Alzheimer and vascular dementias