The Treatment of Diabetic Neuropathy with Biofactors

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Diabetic polyneuropathy is a diabetes-induced secondary disease which occurs in approximately one third of patients with type 2 diabetes [1]. Amongst other things, it results in the formation of diabetic foot syndrome, which in addition to the often significant impairment of the patients' quality of life, is the cause of a large share of diabetes-induced foot amputations.

The therapy of diabetic polyneuropathy is based on three pillars: firstly, the optimisation of metabolic adjustment, secondly in a pathogenetically substantiated therapy, and thirdly in symptomatic treatment. For the pathogenetically substantiated therapy with biofactors there are a number of approaches, of which benfotiamine and alpha-lipoic acid are currently confirmed by studies, and are available for practical use.

Benfotiamine is a lipid-soluble thiamine (vitamin B1) derivative with a significantly higher level of bioavailability than water-soluble thiamine salts [2]. The active metabolite of thiamine (thiamine diphosphate - TDP or thiamine pyrophosphate - TPP) is formed in the target cells (e.g. in the peripheral nerve cells) and serves as a coenzyme in the carbohydrate metabolism. AGE production (AGE equals Advanced Glycation End products) is inhibited in particular by the influence on transketolase, so that the extent of nerve damage is reduced. The efficacy of benfotiamine in diabetic polyneuropathy has been shown in randomised, placebo-controlled double-blind studies, in which benfotiamine was shown to have an advantage over the nerve conduction velocity, as well as improving the clinical symptoms and the neuropathy symptoms score (NSS) compared to placebo [3-5]. Additionally, there are several open studies and individual case reports available which confirmed the efficacy of benfotiamine in diabetic polyneuropathy.

Alpha-lipoic acid is part of the pyruvate dehydrogenase complex, so that there is a close relationship with thiamine, the glucose metabolism and the energy management in the cells. Not only the antioxidant properties, but also the optimisation of the energy supply to the nerve cells explain the positive effect of alpha-lipoic acid demonstrated in various clinical studies on diabetic polyneuropathy. In several publications the positive effect of the intravenous or oral application of alpha-lipoic acid on reducing neuropathic symptoms has been described [6.7], while a further study has shown an improvement in some neuropathic deficits, but not the nerve conduction velocity [8].

Benfotiamine and alpha-lipoic acid complement one another in terms of their mechanisms of action [9], so that a combination of these two substances can be expected to optimise their efficacy in diabetic polyneuropathy. Benfotiamine is extremely well tolerated, so that this substance offers all-round protection to patients with diabetes due to the positive manner in which it affects diabetic comorbidities.

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