

In spite of the fact that the diabetic foot syndrome is not considered a marginal complication of the patients with diabetes mellitus any more, its prevalence and incidence is not decreasing. The fact that early diagnosis and treatment or even prevention of foot ulcers is associated with a decrease in healthcare costs and, more importantly, with reducing patients' suffering, applies also in this case. The dissertation work originated in the Diabetologic Center of the Medical department I., University Hospital and Medical Faculty in Pilsen, Charles University in Prague, which has been dealing with diagnostic and therapeutic procedures in patients with diabetic foot syndrome for over 20 years. The examinations for diagnosis of the main etiologic factors, i.e. peripheral neuropathy and impaired perfusion, belong to already routine ordinary procedures here. My task was to move the diagnostics of this complication to earlier stages, even before the development of the ulcers, through diagnosing an impairment in skin microcirculation.

The aim of the work was to evaluate reactivity of the skin microcirculation in patients with diabetes mellitus using laser doppler flowmetry and to introduce a new method - iontophoresis.

Skin microcirculation assessment has become a center of interest of many studies for its significant role in the pathogenesis of a number of severe diseases. The methods, which are available for microcirculation assessment to date are summarized in the theoretical part of the presented work. In the practical part, the reactivity of the microcirculation in patients with diabetes mellitus type 2 is studied. Differences in microcirculation reactivity between the upper and lower extremities in these patients were compared. The differences were evaluated in patients with and without diabetic neuropathy separately. The observed changes in the reactivity were then separately related to individual tests, routinely used for the diagnosis of diabetic neuropathy (Semmes-Weinstein Monofilaments, Biothesiometer and Neuropad). The last objective of the practical part was to find a relationship between the skin microcirculation and other chronic complications and cardiovascular risk factors.

The results showed a reduction in skin microcirculation reactivity in the lower extremity when compared to the upper extremity.

The study demonstrated a tight association between impaired function of the skin microcirculation and the presence of diabetic neuropathy. The endothelium dependant vasodilatation showed the most significant impairment. The results suggest that autonomic neuropathy (assessed using Neuropad) precedes somatosensory neuropathy (assessed using



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monofilaments).

Patients with diabetic neuropathy are at risk of diabetic foot syndrome development by reduced sensitivity, but also for impaired skin microcirculation. Early, fast and inexpensive identification of the risk group, that is presenting incipient neuropathy and impaired microcirculation, is essential, if we want to reduce the number of patients with a diabetic foot syndrome. The Neuropad test fulfills these requirements.