

# **Small fiber neuropathy in peripheral and autonomic nervous system in patients with diabetes**

## **Abstract**

This dissertation thesis wants to draw attention to the relevance of early detection of small nerve fibers damage in the somatic and autonomic nervous systems in patients with type 1 and type 2 diabetes mellitus (T1DM, T2DM). Only early diagnosis can prevent the severe complications that progressive forms of diabetic neuropathy (DN) bring. The main objectives of this work were to evaluate the possibility of using thermal quantitative sensory testing (TQST) to identify patients with diabetes at higher risk of cardiac autonomic neuropathy (CAN) and distal symmetric polyneuropathy (DSPN) with predominant small nerve fibers impairment. Other aims were to assess the impact of CAN on the development of carotid atherosclerosis and to determine the prevalence and risk factors for depression and anxiety in diabetic patients with and without DN. The results show that TQST can be used as a screening tool to identify patients with a higher risk of CAN. We demonstrated a significant effect of CAN presence on carotid intima-media thickness in patients with T1DM, independently of known risk factors of atherosclerosis. Such a finding suggests that CAN may play a role in the pathogenesis of carotid atherosclerosis. Another study showed that the degree of small nerve fiber damage is dependent on the duration of DM. As part of DSPN screening, it makes sense to test thermal thresholds mainly distally on the lower limbs on the dorsum of the foot. We found a high prevalence of depressive and anxiety symptoms not only in patients with painful DN but also in patients with painless DN and patients without neuropathy. Pain intensity, catastrophic thinking, lower age, female gender, the presence of T2DM, and the severity of DSPN, were identified as the most significant risk factors for emotional stress.

## **Keywords**

Anxiety, cardiac autonomic neuropathy, carotid intima-media thickness, depression, diabetic neuropathy, distal symmetric polyneuropathy, pain, small nerve fibers, thermal quantitative sensory testing