

Abstract (EN)

Endothelial dysfunction is an early marker of atherosclerotic and cardiovascular complications. It is also a target of research aimed at the factors and mechanisms leading to the vascular impairment. The aim of the thesis was to evaluate the microvascular reactivity and endothelial function in patients with specific metabolic and hormonal disorders.

Four separate studies are included in the thesis. First, the influence of hypercortisolism and associated diseases on microvascular reactivity was evaluated in patients with Cushing's syndrome. Second, the changes in microvascular reactivity and endothelial function after standard breakfast were studied in patients with type 2 diabetes. Next two studies were done in type 1 diabetic patients. The impact of acute hyperglycemia on microvascular reactivity was evaluated during hyperinsulinemic isoglycemic and hyperglycemic clamp. Finally, the influence of glycemic variability and insulin treatment on microvascular reactivity and its possible relationship were studied in type 1 diabetic patients.

The results indicate that microvascular reactivity and endothelial function are, among other factors, influenced by insulinemia and insulin resistance. Microvascular reactivity was predominantly impaired by the arterial hypertension and diabetes in patients with Cushing's syndrome. In patients with type 2 diabetes, microvascular reactivity was decreased in fasting compared to the control group and further decrease was observed postprandially. Microcirculation was significantly influenced by insulinemia in both studies in type 1 diabetic patients. However, there was no negative influence of acute hyperglycemia on microcirculation and no significant relationship between glycemic variability and microvascular reactivity was observed.

Keywords: microvascular reactivity, microcirculation, endothelial function, laser-Doppler, type 1 diabetes mellitus, type 2 diabetes mellitus, Cushing's syndrome.