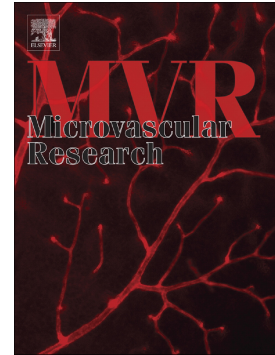


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# Spectral analysis of the blood flow in the foot microvascular bed during thermal testing in patients with diabetes mellitus

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## Abstract

Timely diagnostics of microcirculatory system abnormalities, which are the most severe diabetic complications, is one of the major problems facing modern health care. Functional abnormalities manifest themselves earlier than the structural ones, and therefore their assessment is the issue of primary importance. In this study Laser Doppler flowmetry, a noninvasive technique for the cutaneous blood flow monitoring, was utilized together with local temperature tests and wavelet analysis. The study of the blood flow in the microvascular bed of toes was carried out in the control group of 40 healthy subjects and in two groups of 17 type 1 and 23 type 2 diabetic patients.

The local temperature tests demonstrated that the diabetic patients have impaired vasodilation in response to local heating. The tendency for impaired low frequency pulsations of the blood flow associated with endothelial and neurogenic activities in both diabetes groups was observed. Local thermal tests induced variations in perfusion and its spectral characteristics, which were different in the groups under study. In our opinion, the obtained preliminary results can be a basis for further research and provide a deeper understanding of pathological processes that drive microvascular abnormalities caused by

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