

Evaluation of usefulness of quantitative thermal analysis in non-invasive diagnosis of chronic venous insufficiency.

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Abstract

World statistics have confirmed that about 40-50% of men and 50-55% of women suffer from chronic venous insufficiency (CVI). Currently, the leading diagnostic method of chronic venous insufficiency is duplex ultrasound. However, this method has some limitations, therefore it is important to find a new diagnostic technique that will provide additional parameters describing not only structural changes, but also early metabolic and functional changes.

Thermovision, as a non-invasive and completely safe method, is increasingly used in various fields of medicine. Therefore, the aim of the study was to demonstrate the usefulness of the thermal imaging technique in the diagnosis of chronic venous insufficiency. The results were obtained for two groups: patients with primary chronic venous disease (CVI group) and healthy people (control group). The results obtained from the thermovision examination were correlated with ultrasound parameters. Parameters such as reflux duration and CEAP classification grade were correlated with mean limb temperature, as well as mean lesion temperature (measured by two methods) and thermal range. On the basis of the data obtained during the tests, correlation coefficients for individual parameters were calculated.

The obtained results indicate that the average temperature of the limb, and especially the average temperature of the proposed isothermal area, is significantly correlated with the range of reflux. The conducted tests showed that the correlation between some thermal and ultrasonic parameters determined by the Spearman coefficient is 0.4 ($p < 0.05$).

The research results clearly indicate that thermal imaging can provide not only qualitative, but above all quantitative parameters useful in the diagnosis of chronic venous insufficiency. Thermal imaging parameters seem to be useful and can serve as an initial quantitative diagnosis, as well as parameters derived from Duplex ultrasound.

keywords: chronic venous disease; thermal imaging; thermovision, diagnostic tool