

The Quality of Diagnosis by IR Thermography as a Function of Thermal Stimulation in Chosen Medical Applications

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The working of many physical procedures used in medical science is connected to changes in the temperature of tissue. A research has been carried out into the possibility of using the thermographic technique in evaluating the effectiveness of local cryotherapy procedure (local cryostimulation) in patients with rheumatoid arthritis. The aim of the research was to determine the degree of thermal stimulation intensity during the local cryotherapy procedure and duration of response of the organism to the applied stimulation. The research was based on comparison of temperature distribution on the surface of the hand prior to, immediately after, and at certain intervals after the procedure of local blast of liquid nitrogen vapours or cool air on the hand. All people taking part in the study suffered from rheumatoid arthritis, accompanying illnesses occurring in some of them. Similar procedures were used to study the accompanying reactions connected with application of anti-cellulite cream. In both cases similar reactions of the organism to the applied stimulation were observed. The study allowed to optimize thermal stimulation procedures used in rheumatology and cosmetology.

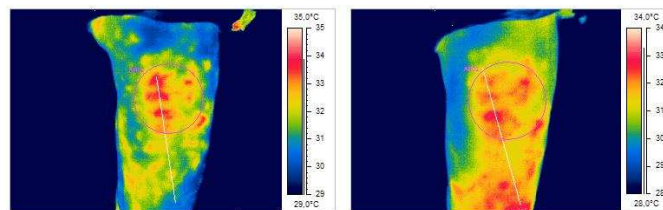


Fig. 1. Thermographic tests in cosmetology

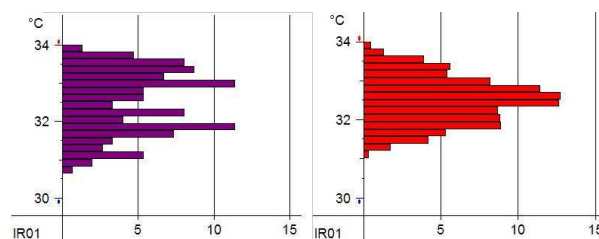


Fig. 2. Cosmetological tests prior to the treatment

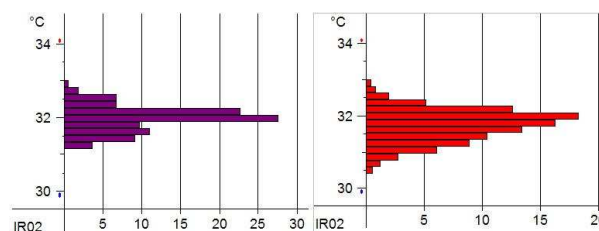


Fig. 3. Cosmetological tests after the treatment

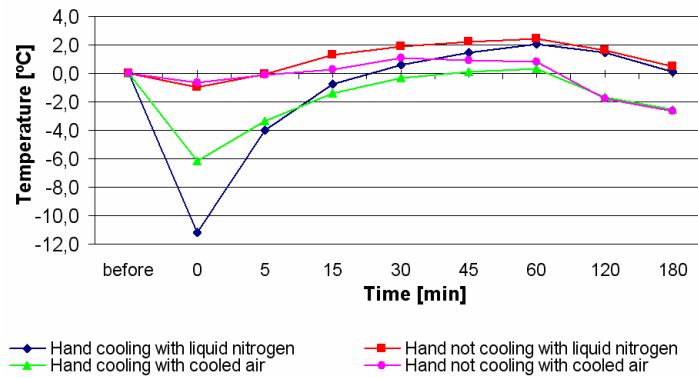


Fig. 4. Response of the organism to thermal stimulation with liquid nitrogen vapours and cool air

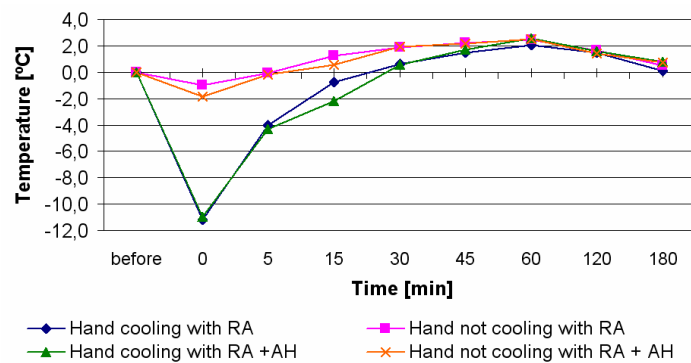


Fig. 5. Response of the organism to thermal stimulation with liquid nitrogen vapours

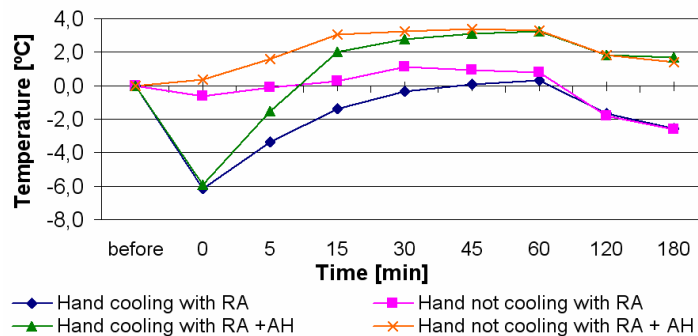


Fig. 6. Response of the organism to thermal stimulation with cool air

The carried out research demonstrated that thermography is a measurement technique useful in analysing thermal reaction of the organism connected with local cryostimulation, in discovering foci of cellulite, and monitoring and evaluating the progress of treatment. It was revealed that the stimulus produced by liquid nitrate vapours is a much stronger thermal stimulation for the patient than the stimulus produced by cool air. Duration of response to the stimulation in patients ill only with rheumatoid arthritis (RA) was longer in the case of stimulation with liquid nitrate vapours. A faster and bigger temperature rise, as well as longer duration of organism response to stimulation with cool air was observed in patients ill with RA and arterial hypertension (AH). Further research should be carried out which would be directed at discovering the proper diversification and adequate optimization of testing procedures concerning cellulite and cryotherapy procedures applied in various morbid cases accompanying RA, as well as in various stages of progression of RA.