Aberrant responses to thermal stimulus of finger vasculature in connective tissue disease patients

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Background. In connective tissue diseases, peripheral blood flow disorder is frequent. It might develop both in limbs and in internal organs, sometimes resulting in a severe outcome including pulmonary hypertension, pseudoileus and fingertip necrosis. When it develops in fingers, fingertip temperature is frequently dispersed aberrantly among fingers.

Objective. Response to cold thermal stimulus is evaluated by thermographic inspection.

Patients and Methods. The connective tissue disease patients with suspected peripheral perfusion disturbance underwent thermo-stimulus test. From before to 30 mins after hand Immersion in 10 °C water for 10 secs, nailfold temperature of each finger was sequentially measured by thermography. Temperature dispersion was evaluated by coefficient of variation (CV: standard deviation/average, right 5 fingers). Sequential change of the temperature was classified into patterns, and in addition, numbers of patient with maximum temperature difference among fingers of over 2ºC were examined.

Results. Twenty-seven patients were included. CV was 0.030 at baseline, and increased to 0.057 5mins after finishing immersion. The sequential change of the temperature was roughly classified into 4 patterns: (1) near-normal, n=6, (2) delayed recovery, n=10, (3) persistently low, n=6, and (4) rebound, n=4. The numbers of patient with a 2ºC< temperature difference among fingers in each group were (1) 2, (33.3%), (2) 10 (90.9%), (3) 6 (100 %), and (4) 3 (75.0%).

Conclusion. In connective tissue diseases patients with a suspected peripheral perfusion disorder, temperature dispersion among fingers evaluated by CV were frequently observed. Sequential temperature change from before to after cold water hand immersion might be classified into 4 patterns. Temperature dispersion among fingers was frequent especially in association with aberrant temperature recovery.
Reference.