

# 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 a severe outcome including pulmonary hypertension, pseudooleus 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 2°C 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 2°C< 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.**

Horikoshi M, Inokuma S, et al. “Thermal disparity between fingers after cold-water immersion of hands: A useful indicator of disturbed peripheral circulation in Raynaud phenomenon patients” *Intern Med.* 2016;55:461-6