

Stress Infrared Telethermography Is Useful in the Diagnosis of Complex Regional Pain Syndrome, Type I (Formerly Reflex Sympathetic Dystrophy)

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Objective: To assess the sensitivity, specificity, and predictive value (PV) of stress infrared telethermography (IRT) in the Complex Regional Pain Syndrome, Type I (CRPS-I). **Methods:** One hundred eighty-five consecutive patients (47 men, 138 women) with 205 pairs of chronically painful limbs (upper, lower, or both) were examined by pain specialists in neurology, physiatry, and anesthesia, who then reached a consensus diagnosis. A clinical diagnosis of CRPS-I required at least two of the following observations: burning pain, vasomotor changes, diaphoresis, trophic changes, allodynia. Patients with only one criterion were classified as possible CRPS-I; those with none were judged not to have CRPS-I. Patients and 24 asymptomatic control subjects underwent stress IRT, which was considered positive for CRPS-I if it showed three of the following: quantitative thermal emission of $> 1.00^{\circ}\text{C}$, abnormal distal thermal gradient patterns, presence of a "thermal marker," and abnormal response to functional cold water autonomic stress testing. **Results:** By clinical criteria, CRPS-I was diagnosed in 73 pairs of limbs; not CRPS-I was diagnosed in 70; and 62 pairs had possible CRPS-I. Excluding possible CRPS-I cases, there were 5 false-negative stress IRTs (sensitivity 93%) and 7 false-positive results (specificity 89%). Based on estimated 50% prior probability for our population, the positive PV is 90% and the negative PV 94%. None of the control subjects exhibited thermographic evidence of CRPS. **Conclusion:** Stress IRT is a sensitive and specific indicator of CRPS-I.

Keywords: Complex Regional Pain Syndrome, Type I ; Reflex Sympathetic Dystrophy; Thermography; Infrared Imaging; Pain