Thermal imaging and trichoscopy for detecting inflammation in frontal fibrosing alopecia.

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AIM: to explore the value of a combination of thermal imaging analysis and dermoscopy to objectively quantify the activity of the inflammatory process in FFA, using scalp biopsy as the gold standard.

METHODS: 22 patients with frontal fibrosing alopecia were examined by both infrared thermography and optical dermoscopy before tissue sampling. Evaluation of the inflammatory infiltrate was based on a semiquantitative analysis with grading from negative (0), through mild (+) and moderate (++), to severe (+++).

Thermal imaging guided scalp biopsy

thermography camera FLIR T420
(FLIR Systems AB, Taby, Sweden)

$\Delta T_{avg} > 0.5^{\circ}C$
determines scalp biopsy site

Dermoscopy guided scalp biopsy

handheld dermoscope DermLite DL3
(3Gen Inc., San Juan Capistrano, CA, USA)

erythema (E) and/or perifollicular scaling (PS)
determine scalp biopsy site

ΔT_{avg} = difference between average temperature values
at dermoscopic area (DA) and at lower area of the forehead (LA)

**ACTIVE
DISEASE**

RESULTS: Histopathology classified 14 (64%) subjects as being in the active disease phase of FFA and eight (36%) as in the inactive one.

indicators	Thermal imaging	Scalp dermoscopy		Thermal imaging combined with dermoscopy		
	$\Delta T_{avg} > 0.5^{\circ}C$	E	PS	$\Delta T_{avg} > 0.5^{\circ}C$ & E	$\Delta T_{avg} > 0.5^{\circ}C$ & PS	$\Delta T_{avg} > 0.5^{\circ}C$ & E & PS
sensitivity	86%	100%	71%	86%	64%	64%
specificity	37,5%	25%	50%	50%	75%	88%
PPV	71%	70%	71%	75%	82%	90%
NPV	60%	100%	50%	67%	55%	58%

PPV=positive predictive value; NPV=negative predictive value;

Conclusion: Infrared thermography and scalp dermoscopy may potentially eliminate a need for scalp biopsy to predict an activity of frontal fibrosing alopecia.