

## Flow mediated change of finger-tip temperature in patients with high cardiovascular risk

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### Introduction

Endothelial function can be assessed in humans by postocclusive forearm reactive hyperemia (PORH). The PORH is partially related, at least during the late phase to the endothelial release of NO (1,2). The change of the forearm blood flow in PORH can be detected by finger-tip temperature (FTT). Authors elaborated a new method for assessed vascular function based upon the measurement of FTT.

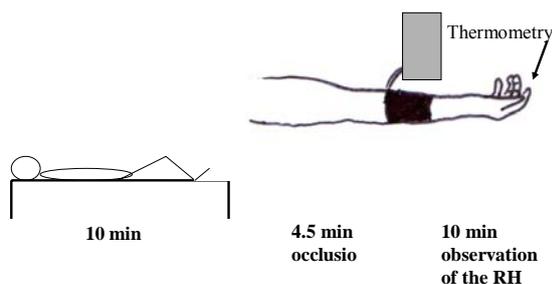
### Patients and methods

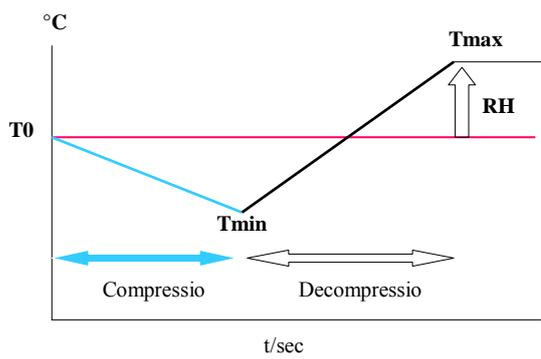
50 healthy and 147 high-cardiovascular risk patients (ESH-ESC 2003 stratification) were involved into the study. Simultaneously 30 hypertensive patients were studied by Celermajer's flow mediated dilatation (FMD) and by our flow mediated thermometry method (FMT).

Finger-tip temperature was measured by computer operated FTM-101 infra red skin thermometer. For FMD we are using an Acuson 128 ultrasound device and a 7.0 MHz linear array transducer.

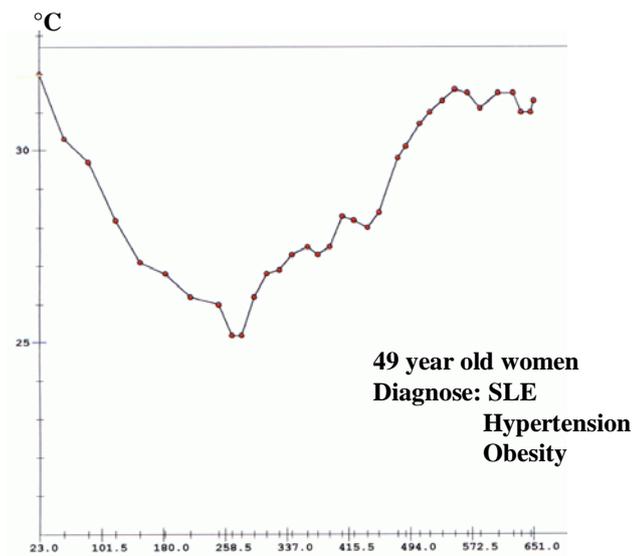
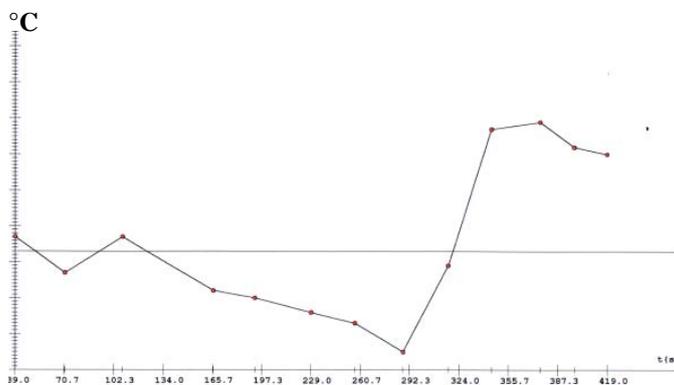


The patient layed supine in a quiet room with room temperature (20-25°C) for 10 minutes. Following the baseline measurement of finger-tip temperature (T<sub>0</sub>), RH was induced in the forearm by inflation of blood pressure cuff for 4.5 minutes. Finger-tip temperature was measured just before cuff deflation (T<sub>min</sub>) and was monitored regularly for 10 minutes during the post deflation phase. The RH was characterised by maximal temperature (T<sub>max</sub>) over the T<sub>0</sub>.





**Healthy women 56 years old.**



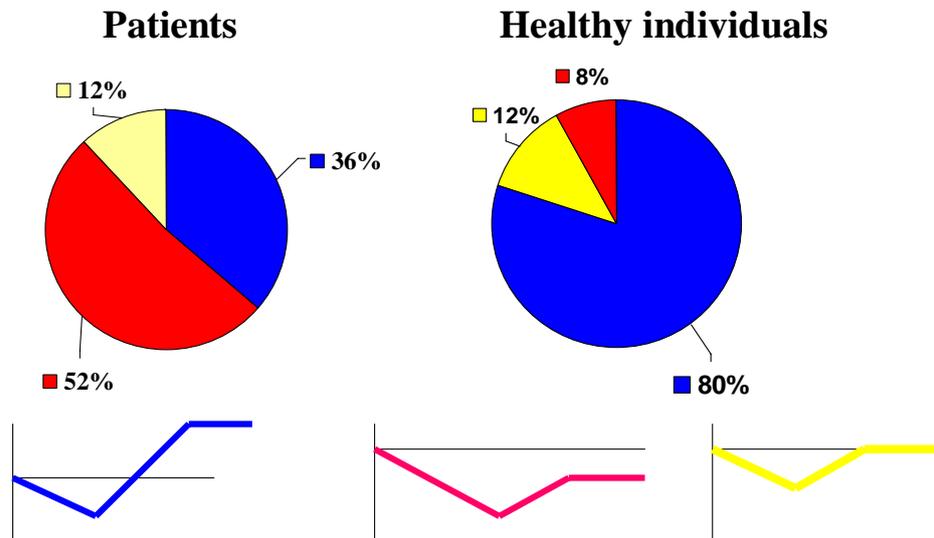
## Results

The pathologic/normal ratio of the patients examined by the two metodes (FMD and FMT) was the same:

$\chi^2 = 0.634, 0.50 > p > 0.30$ .

In healthy individuals the maximal temperature of finger-tip was higher as T0 (Tmax: 31.6±1.7 vs 30.3±2.6°C p<0.001).

But in high risk patients the average finger-tip temperature during hyperemia just reached the baseline value (Tmax: 30.7±2.7 vs 30.8±2.6°C p=ns.) The steep of the curve, (Tmax-Tmin/tmax-tmin) was 2.1±1.0 in the healthy individuals but only 0.9±0.6 in the patients, p<0.001.



The change of finger-tip temperature in healthy and high cardiovascular risk patients

| Change of Temperature (°C)          | Healthy individuals | Patients | p      |
|-------------------------------------|---------------------|----------|--------|
| $\Delta(T_{max}-T_0)$               | 1.3±1.1             | 0.1±1.1  | <0.01  |
| $\Delta(T_{max}-T_{min})$           | 3.2±1.5             | 2.2±0.9  | <0.01  |
| $T_{max}-T_{min}/t_{max}-t_{min}^*$ | 2.1±1.0             | 0.9±0.6  | <0.001 |

\* the steep of the curve

### Conclusion

PORH can be assessed by the measurement of finger-tip temperature.

In most of the high-risk patients absent the PORH in contrast with healthy individuals.

According to our observations, FMT is suitable for the examination of the vascular function.

### References

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