Laser Speckle Contrast Imaging for Assessing Superficial Perfusion in Feet

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Purpose
Laser Speckle Contrast Imaging provides non-invasive measures of superficial microvascular perfusion, which may assist detection of poorly perfused areas in skin and wound bed tissue. This study tested reproducibility & test-retest reliability of LSCI for assessing superficial perfusion in feet.

Methods
Sample: Adults with diabetes attending high-risk foot clinic

Procedure:
• Recordings taken in controlled temperature room, after patients rested for 15 minutes.
• Two recordings of 60 seconds, taken 30 seconds apart on dorsal and plantar high and low pressure regions of interest
• Process repeated one week later to test reproducibility.

Results

Participants (n=31):
Mean age 66 years (sd 10.3), 77% male

Test-retest reliability: Very good
Cronbach’s Alpha 0.97–0.99

Reproducibility: Good, Cronbach’s Alpha 0.87–0.96 however lower over dorsum (0.60)

Perfusion and clinical correlates:
Lower perfusion significantly associated (p<0.05) with:
- high Ankle Brachial Pressure Index
- increased wound duration
- decreased mobility
- increased pain
- respiratory disease

Conclusion
Results suggest LSCI has the potential for reliable clinical assessment of superficial perfusion of the foot.