Cost-effectiveness of laser Doppler imaging in burn care in the Netherlands: a randomised controlled trial

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Aim
To analyse the effectiveness and cost-effectiveness of the LDI in specialised burn care.

Background
In patients with burns an early accurate diagnosis of burn depth is essential to determine optimal treatment. The combination of Laser Doppler imaging (LDI) and clinical assessment leads to an accurate estimate of burn depth1. However, the actual effects of the introduction of LDI on therapeutic decisions, clinical outcomes and costs are unknown.

Methods (recently published)2
- Study design: randomised controlled trial in all the three Dutch burn centres
- Participants: all patients (in- and outpatient) with burns of indeterminate depth within 5 days post-burn
- Randomisation (SNOSE):
  1. standard care group (SC, burn depth and treatment based on clinical assessment only)
  2. LDI group (burn depth and treatment based on clinical assessment + LDI results)
- Intervention: LDI scan was made of all wounds of indeterminate depth but the results were only revealed to the treating clinician in the LDI-group
- Primary outcome measure: time to wound healing i.e. >95% reepithelialisation
- Secondary outcomes: diagnostic and therapeutic decisions, QoL, Scar Quality and economic evaluation
- Data analysis/statistics: Intention-to-treat principle

Results
- Patients: N=202, comparable patient and burn characteristics
- Primary outcome: no significant difference in time to wound healing (fig.1)
  - Sub-analysis (mixed model analysis)
  - Clinically surgically treated patients had a shorter time to wound healing: 16.0 days (95%CI 13.5-18.5) in the LDI group vs. 19.9 days (95% CI 17.5-22.3) in the SC group (p=0.022).
- Secondary outcomes
  - Diagnostic decisions: sensitivity of 93.5% and specificity of 88.6%
  - Therapeutic decisions:
    - significant more decisions made on LDI day in LDI group (P<0.001)
    - no significant differences in mean time to decision for surgical treatment or time to actual surgery.
  - Sub-analysis: clinical patients had a shorter time to surgical decision 4.1 days (95% CI 2.5-5.7) in the LDI group vs. 6.5 days (95% CI 5.0-8.1) in the SC group (p=0.029).
  - Similar costs of treatment

Conclusion
- No overall difference in time to wound healing by diagnostic strategy.
  - The LDI proved to provide a guidance for therapeutic decisions with a significantly shorter time to wound healing in the subgroup of patients who were treated clinically and surgically.
  - Time to surgery can be reduced with 2.4 days which has a potentially cost-saving effect of € 815 per scanned patient.

Discussion
- Broad inclusion criteria (LDI in outpatient setting not frequently indicated)
- Cost and effects studied depended on local treatment preferences
- Results on costs only apply for high-income countries
- Optimal treatment for burns with a mixed/intermediate healing potential of 14-21 days is unclear, further research is required

References