In vivo measurement of pressure and stiffness with a new multi-layer compression kit

Charles H¹, Damstra RJ², Fürst D³, Jünger M⁴, Partsch H⁵

- ¹ St. Charles Family Health Centre, London, UK
- ² Nij Smellinghe Hospital, Drachten, NL
- ³ Lohmann & Rauscher GmbH & Co KG, Moulhouse, F

Purpose of Study

To evaluate in vivo measurements of interface pressure on the leg in different body positions as a clinically applicable method to assess stiffness.

Test material

Rosidal[®] sys (short-stretch) Perfekta® strong (long-stretch)

Study Centres

Austria The Netherlands **United Kingdom** Germany

⁴ Dpt. for Dermatology and Venerology, Greifswald, D

⁵ Medical University, Vienna, A

Study Group n = 60 44.8 years mean age: 21- 87 years range: male: 18 female: 42 open ulcer: 12 lymphoedema: 3

Bandaging Application

supine or sitting position sub-bandage measurements in:

- supine and 1x dorsal extension
- sitting and 1x dorsal extension
- standing and 1x dorsal extension

Pressure Measurement

Kikuhime Measuring Device

with the large pressure probe

applied at the B1 point at the medial lower leg in the region where the muscular part of the muscle turns into the tendinous part. Padding was applied over the fixed sensor.

The sensor was

France



Rosidal[®] sys or Perfekta[®] strong was applied according to manufactures instructions.





Monitoring for 24 hours



The pressure monitors were secured in patients' trouser pockets or taped below the knee.



Discussion

- 1. Stiffness
- = increase of pressure due to increase in circumference (CEN-document)
- Short stretch (Rosidal® sys) shows a significant increase of pressure by
- · standing up from supine position dorsiflexion
- The amount of pressure increase is a parameter for stiffness (Static Stiffness Index [SSI]: mmHg standing - supine) (1).

2. Variability

- among different centres
- · among different bandagers
- even with the same bandager (such problems, which are especially important for studies are less pronounced with stockings)

Partsch H. The Static Stiffness Index (SSI) – a simple method to assess the ela property of compression material in vivo. Dermatol Surg (2005) 31: 625 - 630

3. Pressure loss

short stretch

starts immediately after

is more pronounced with

bandage application

Conclusions

- The interface pressure of a compression bandage measured at B1 gives valuable information on the:
 - •resting pressure in supine and standing position stiffness
- This is important for the assessment of bandages, especially of multi-layer kits, to compare the pressure and the elastic properties of the different systems in vivo.