

Compression Bulletin 23

Robert Stemmer Library on Compression Therapy

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Robert Stemmer Library on Compression Therapy was created by Robert Stemmer. It is a complete collection of publications of scientific and medical journals. It consists of three parts:

- Handbook "Compression Therapy of the extremities", edited by Robert Stemmer in 1999 continuous literature updates, which are regular amendments of the handbook.
- The Compression Bulletin reports about important new publications.
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SIGVARIS AG

CH-9014 St. Gallen
Tel. +41 71 272 40 00
Fax +41 71 272 40 01

SIGVARIS SA

F-68330 Huningue
Tel. +33 3 89 70 2400
F-42176 St-Just-St-Rambert
Tel. +33 4 77 36 08 90

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Prandoni P, Noventa F, Quintavalla R, Bova C, Cosmi B, Siragusa S, Bucherini E, Astorri F, Cuppini S, Dalla Valle F, Lensing AWA, Prins MH, Villalta S on behalf of the Canano Investigators

Thigh-length versus below-knee compression elastic stockings for prevention of the postthrombotic syndrome in patients with proximal-venous thrombosis: a randomized trial

Blood 2012; 119: 1561–5

Background

Below-knee compression elastic stockings (CES) are effective for the prevention of the postthrombotic syndrome (PTS). Nevertheless, a substantial number of patients with CES still develops PTS.

Methods

In the present open label, randomized clinical trial, thigh-length CES were compared with below-knee CES for the prevention of PTS. A total of 267 patients with the first episode of proximal deep venous thrombosis were randomized to wear either thigh-length or below-knee CES for 2 years. After 3, 6, 12, 18, 24 and 36 months, they were assessed for PTS manifestations according to the Villalta scale.

Results

PTS was developed in 44 (32.6%) of the 135 patients randomized to thigh-length CES and in 47 (35.6%) of the 132 allocated to below-knee CES for an adjusted hazard ratio of 0.93 (95% confidence interval, 0.62–1.41). Severe PTS was developed in 3 patients in each group. CES-related side effects like itching and erythema developed in 55 (40.7%) of the 135 patients allocated to thigh-length CES and in 36 (27.3%) of those randomized to the below-knee group ($P = 0.017$) and led to premature discontinuation of their use in 29 (21.5%) and 18 (13.6%) patients.

Conclusion

The authors conclude that thigh-length CES do not offer a better protection against PTS than below-knee CES and are less well tolerated.

Comment

This study confirms that in most of the cases below-knee CES are sufficient for PTS prevention and show a better compliance compared to thigh-length CES. In individual cases with persisting thigh edema thigh-length CES may still have their benefit.

Blazek C, Amsler F, Blaettler W, Keo HH, Baumgartner I, Willenberg T

Compression hosiery for occupational leg symptoms and leg volume: a randomized crossover trial in a cohort of hairdressers

Phlebology 2012; Mar 26. [Epub ahead of print]

Background

Hairdressers tend to develop leg swelling and subjective symptoms due to long standing.

Objectives

of this study was to investigate the influence of medical compression stockings on these occupational problems.

Methods

Subjective symptoms were monitored using a comprehensive questionnaire, and the effect of wearing medical compression stockings (MCS; 15–20 mmHg; SIGVARIS Diaphane® for ladies/Urban® for men) on these symptoms and on lower leg volume (measured with a Perometer) was compared with no treatment in a randomized cross-over study encompassing 3 weeks without and 3 weeks with compression.

Results

98 hairdressers (83% women; median age 42.3 yrs; clinical stage C0 13%, C1 69%, C2 7%, C3 10%; median hours working per week 42, median time spent upright 90%) completed the study. Feelings of tired and heavy legs, the belief to be a restless person and to have unattractive legs showed the highest prevalence (<84%). Wearing MCS reduced the symptom score for pain and feelings of swelling (range 0–4) by an average of 0.22 (12%), $P < 0.001$. At the same time sleep disturbance got better, to have unattractive legs was less of a concern, and depressiveness was less severe. Interestingly, individuals who had no stockings during the first 3 weeks showed also a significant decrease of these symptoms (by 0.10 (6%), $P = 0.015$). The group who started with MCS reported an exacerbation after no use of compression during the following 3 weeks (by 6.3%; $P = 0.173$). Only three items revealed a significant improvement by wearing MCS: neuro-muscular symptoms, unrest and emotional stress, and unusual symptoms ($P < 0.01$).

Wearing MCS for 3 weeks reduced the lower leg volume by an average of 19 ml ($P < 0.001$) but a reduction of

around 10 ml was also seen in the group who started with no compression (not significant). There was no correlation between the effects of wearing MCS on subjective symptoms and on leg volume changes.

Conclusion

Symptoms like leg pain, feelings of swelling and heaviness occur in individuals also with normal leg veins working in a profession requiring prolonged standing and have an impact on the psychic state of health. Wearing MCS (ankle pressure 15–20 mmHg) provides substantial relief. Leg volume reduction appears to be a concomitant effect and not the direct cause of the benefit.

Comment

The most important result of this study is the significant improvement of a long list of subjective complaints after long standing. By wearing compression stockings the change of leg volume, ranging between –129 ml and +155 ml (mean –18.6 ml), was statistically significant.

Chang ST, Hsu JT, Chu CM, Pan KL, Jang SJ, Lin PC, Hsu HC, Huang KC

Using intermittent pneumatic compression therapy to improve quality of life for symptomatic patients with infrapopliteal diffuse peripheral obstructive disease

Circulation 2012; 76: 971–6

Background

The acute effect of intermittent pneumatic compression (IPC) therapy has been documented for patients with symptomatic peripheral arterial obstructive disease (PAOD). However, its efficacy in improving quality of life (QOL), especially for those with infrapopliteal diffuse lesions, remains unclear.

Methods

31 patients with infrapopliteal diffuse or multiple segmental lesions were enrolled in the study. Based on receipt of IPC therapy (3h daily for 3 months), patients were allocated to the study (n = 23) or control (n = 8) group. The 6 min walking test, transcutaneous oxygen tension (TcPO₂), and QOL evaluated with the Short-Form 36 questionnaire were measured at the beginning and end of the study.

Results

In the QOL analysis, scores for physical functioning, physical and emotional role functioning, bodily pain, and general and mental health showed significant changes after IPC therapy. In the 6-min walking test, duration, and the initial and absolute claudication distances were significantly increased in the study group. The TcPO₂ also significantly increased in the distal end of the target limb after IPC therapy.

Conclusion

Patients at high risk for amputation with infrapopliteal diffuse or multiple segmental lesions can improve their walking ability, TcPO₂ of the target limb and QOL after IPC therapy.

Comment

The effectivity of IPC in different indications is often controversially discussed. In PAOD however the evidence for this treatment is high. Despite the small number of cases this study demonstrates the benefit for a group of patients in which invasive treatment is complicated or even impossible.

Mosti G, Partsch H

Compression stockings with a negative pressure gradient have a more pronounced effect on venous pumping function than graduated elastic compression stockings

Eur J Vasc Endovasc Surg 2011; Aug, 42(2): 261–6

Background

A pressure gradient providing higher pressures over the ankle than over the calf is generally considered to be an important prerequisite for optimal compression.

Objectives

To measure the effect on the venous pumping function of a stocking providing a negative pressure gradient with higher pressures over the calf in comparison to a conventional graduated elastic compression stocking (GECS) in patients with advanced venous insufficiency.

Methods

30 patients with severe superficial chronic venous insufficiency were included into this experimental study in which two elastic stocking designs were compared: a conventional GECS (distal pressure 22 mmHg, calf pressure 19 mmHg) and a stocking exerting a higher pressure over the calf (29 mmHg) than over the ankle (19 mmHg) producing a “progressive” increase in compression (PECS).

Venous pumping function of the calf was assessed by measuring the ejection fraction (EF) from the lower leg by a plethysmographic method during a standardised walking exercise. Interface pressure of the 2 compression devices was simultaneously recorded both at B1 = 12 cm above ankle, C = at the widest part of calf.

Results

The mean increase of EF produced by PECS was +75% (95 CI 48, 7–101.3) compared with +32% (95% CI 16, 8–48.6) with GECS ($P < 0.001$). The correlation between EF and the stocking pressure measured at calf level during standing and walking was statistically significant.

Conclusion

In mobile patients with chronic venous insufficiency stockings exerting a higher pressure on the calf than on the ankle show a greater haemodynamic efficacy in increasing the venous ejection fraction from the leg.

Comment

It needs to be stressed that these results have been obtained in patients with venous incompetence performing a walking test in order to measure the calf muscle pump function. The results may not be extrapolated to immobile or to oedema-patients of non-venous origin. Future trials will be needed to clarify if a negative pressure gradient could not even be counterproductive by causing oedema in the distal parts of the lower leg.

Wong IK, Andriessen A, Lee DT, Thompson D, Wong LY, Chao DV, So WK, Abel M

Randomized controlled trial comparing treatment outcome of two compression bandaging systems and standard care without compression in patients with venous leg ulcers

Journal of Vascular Surgery 2012; 55: 1376–85

Background

Compression therapy is not common for venous leg ulcer patients in Hong Kong.

Methods

This randomized controlled trial compared the clinical effectiveness of compression bandaging using four-layer bandaging (4LB) or short-stretch bandaging (SSB) and usual care (moist wound healing dressing without compression). The 24-week study looked at venous leg ulcer patients aged > 60 years in a community setting. The primary parameter was time to ulcer healing. Secondary parameters were ulcer area and pain reduction comparing week 0 (start) versus week 24 (end), measuring results per group and between groups. Intention-to-treat analysis involved descriptive statistics, survival analysis, and repeated measures analysis of variance. The log-rank test was used

for univariable analysis. All withdrawn patients had a negative outcome score over the whole study duration.

Results

Of 321 patients who received randomized treatment, 45 (14%) did not complete the 24-week study period. After 24 weeks, Kaplan-Meier analysis on healing time was statistically significant ($P < 0.001$) in favor of the compression groups. The mean (SD) healing time in the SSB group (9.9 [0.77]) was shorter than that of the 4LB group (10.4 [0.80]) and the usual care group (18.3 [0.86]). Pain reduction was significant ($P < 0.001$) for the compression-treated groups only.

Conclusion

Compression bandaging was more effective than usual care without compression. Both compression systems were safe and feasible for venous ulcer patients in a community setting in Hong Kong.

Comment

Compression treatment belongs to standard of care for venous leg ulcer patients. This study confirms that compression is more effective in ulcer healing compared to no compression. Four-layer bandaging showed no additional benefit compared to short-stretch bandaging.

Mosti G, Picerni P, Partsch H

Compression stockings with moderate pressure are able to reduce chronic leg oedema

Phlebology 2011; Nov 16. [Epub ahead of print], PMID: 2090466

Background

In patients with chronic oedema of the extremities a classical therapeutic concept is to start compression with inelastic bandages and to switch over to stockings only when no more volume reduction can be achieved by bandaging.

Aim

To compare the efficacy of compression stockings and inelastic, high-pressure bandages concerning leg volume reduction in patients with chronic leg oedema.

Methods

42 legs with chronic leg oedema due to venous pathology were randomized to receive a strong inelastic bandage with a median pressure of 63 mmHg (IB) or an elastic stocking (ES) exerting a pressure of 23–32 mmHg. Changes in leg oedema were assessed after two and seven days by water displacement volumetry, measurements of leg

circumferences and of skin thickness by Duplex ultrasound. Interface pressure was registered under the compression devices for seven days.

Results

There was no significant difference between elastic stockings and inelastic bandages, which both produced a significant reduction in leg volume after two and seven days (ES 2 days –9.6%, 7 days –13.2%; IB 2 days –11.5%, 7 days –15.6%). Bandages showed a more pronounced reduction in leg circumference and in skin thickness in the calf region. There was a pressure drop of IB in the lying position from initially 63 to 22 mmHg after two days, but only from 33 to 26 mmHg under ES (median values). The optimal pressure range concerning oedema reduction was found between 40 and 60 mmHg, while higher pressures produced by bandages showed an inverse correlation with volume reduction.

Conclusion

After 2 days compression stockings exerting a pressure of around 30 mmHg are nearly as effective as high-pressure bandages with an initial pressure over 60 mmHg in reducing chronic leg oedema.

Comment

The main reason for starting compression therapy in patients with chronic leg oedema with bandages instead of compression stockings is an economical concern: due to the fast volume reduction of the leg stockings will not fit anymore after a few days and new stockings with smaller sizes need to be prescribed.

Fax registration

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Fax +41 71 274 29 27

SIGVARIS AG
CH-9014 St. Gallen
Tel. +41 71 272 40 00

SIGVARIS SA
F-68330 Huningue
Tel. +33 3 89 70 2400
F-42176 St-Just-St-Rambert
Tel. +33 4 77 36 08 90

