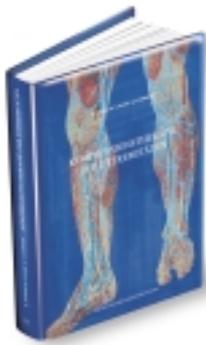


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Compression Bulletin

A selection of some interesting articles is extracted and discussed in the Compression Bulletin (available by fax or e-mail)

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Identical chapter-titles in the continuous literature update and in the Compression Bulletin

H E Gerlach, W Blättler

Introducing controlled outpatient management of deep venous thrombosis: A feasibility study with 827 patients

Phlebologie 2002;31:77-84

Background

Randomized studies have demonstrated that treatment of patients with proximal deep venous thrombosis (DVT) can be performed on an outpatient basis with low-molecular-weight heparin (LMWH) with the same outcome and risk profile as with hospitalization and usage of standard heparin. Despite this many physicians in private practice are still reluctant to treat DVT on an outpatient basis. The intention of this study was the controlled introduction of this treatment in the practices of phlebologists in Germany. This prospective feasibility study with a 28-day follow up was called KAB-Study.

Methods

Prior to the study, participating phlebologists were trained in courses in selection of patients, the standardised treatment regimen with low-molecular-weight-heparin (Tinzaparin), early oral anticoagulation with phenprocoumon (Vit. K-Antagonist), and compression therapy.

Patients were selected according to the following criteria:

- Duration of symptoms < 14 days
- Compliance for systematic documentation
- Strictly standardised treatment regimen

All the included patients were symptomatic and mobile at the time of diagnosis.

Diagnosis of DVT was performed by sonography or phlebography.

Treatment was performed with Tinzaparin (s.c. once daily, 175 IE anti Xa / kg body weight) for at least 6 days. Phenprocoumon was started on the 1st day with a standardised dosage of 9mg followed by 6mg on the second and 4,5mg on the third day and was then monitored by prothrombin time.

Two days after the INR of > 2,0 has been reached LMWH application was stopped. Compression therapy was mandatory. Short-stretch-bandages or compression stockings class 2 or 3 (below knee or leg long) could be used depending on the decision of the phlebologist.

In addition patients were advised to walk at least 4000 steps per day – controlled by step-counter.

Results

Goals of the study were to evaluate the:

1. Decision process for out-patient-treatment
2. Practicability of this regimen
3. Quality of treatment
4. Clinical outcome and safety of treatment

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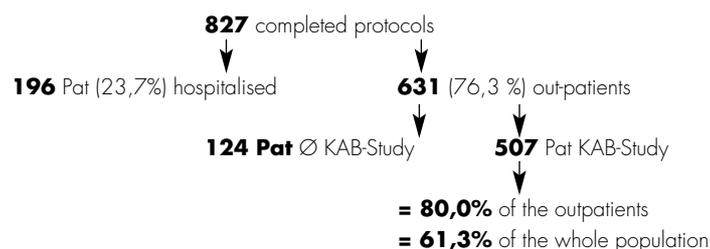
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67 phlebologists participated in the study. Diagnosis was performed by duplex ultrasound in 82 % and by compression sonography or phlebography in 18 %.



Hospital admission was favoured for proximal extension, pronounced oedema, shorter duration of symptoms, presence of a malignancy, advanced age and signs of pulmonary embolism.

LMWH treatment was performed with a mean of 11 days and a median of 8 days. Oral anticoagulation reached a mean INR value of 2,2 on the 7th day and of 2,4 on the 28th day. At the end of the third week 87,1 % were treated with oral anticoagulation.

Compliance of compression therapy was approximately 80%. Proportion of below knee class 3 stockings increased during the treatment and follow up period (Fig. 1).

In the 507 KAB patients no death, no suspicion of thrombus progression and no recurrent thrombosis was observed during the 4 weeks follow up period. Anticoagulation and com-

pression therapy caused no complications. In particular no major bleeding occurred. Pain was reduced in 75 % of the patients at diagnosis to 11% after 4 weeks. After 4 weeks patients were almost back to normal.

Conclusions

This study demonstrated that standardised outpatient treatment of DVT is practicable, safe and efficient.

The fact that hospitalisation for DVT is not necessary for all of the patients is well known from other studies. Realisation in practice however was difficult to achieve.

After sceptical comments in the beginning, it was demonstrated that the majority of the outpatients with DVT can be treated at home.

The safety of outpatient treatment of iliac vein thrombosis with LMWH, compression and ambulation was demonstrated by Partsch in an earlier study.

In the KAB study only 38 % of the iliac DVT patients were treated in this way. This was due to the fact of higher age and concomitant diseases in this group of patients.

No medical problems occurred in the KAB patients, especially no secondary hospitalisation and no symptoms of recurrent DVT.

Compliance with compression therapy was high.

Interestingly 80 % of the crural and 29 % of the iliac DVT were primarily treated with a below knee elastic stocking, class III (Sigvaris 504). These results have to be reevaluated in further studies.

In conclusion outpatient treatment of DVT in suitable cases is a safe and cost – effective procedure.

	Hospital admission		Outpatient treatment	
			KAB	non KAB
patients	96		507	124
age / years				
median	62		57	60
gender				
% female	55		47	57
previous DVT %	22		20	22
duration of symptoms				
1-7 d	74		73	55
8-14 d	15		14	16
>14 d+	11		13	29
		risk factors%		
unknown	62.7		59.8	62.1
accident / operation				
Immobilisation	23.5		30.0	28.2
hormones/pregnancy	3.1		5.9	3.2
malignancy	10.7*		4.3	6.5
		leg oedema%		
moderate	55.1		84.1	87.8
severe	44.9		16.0*	12.1*
clinical signs of lung embolism%	9.7		5.9	6.4

* p<=0.01 χ^2 marked value, compared with rest + symptoms of > 14 days was exclusion criterium

Tab. 1: Demographic and clinical data in the 3 treatment groups.

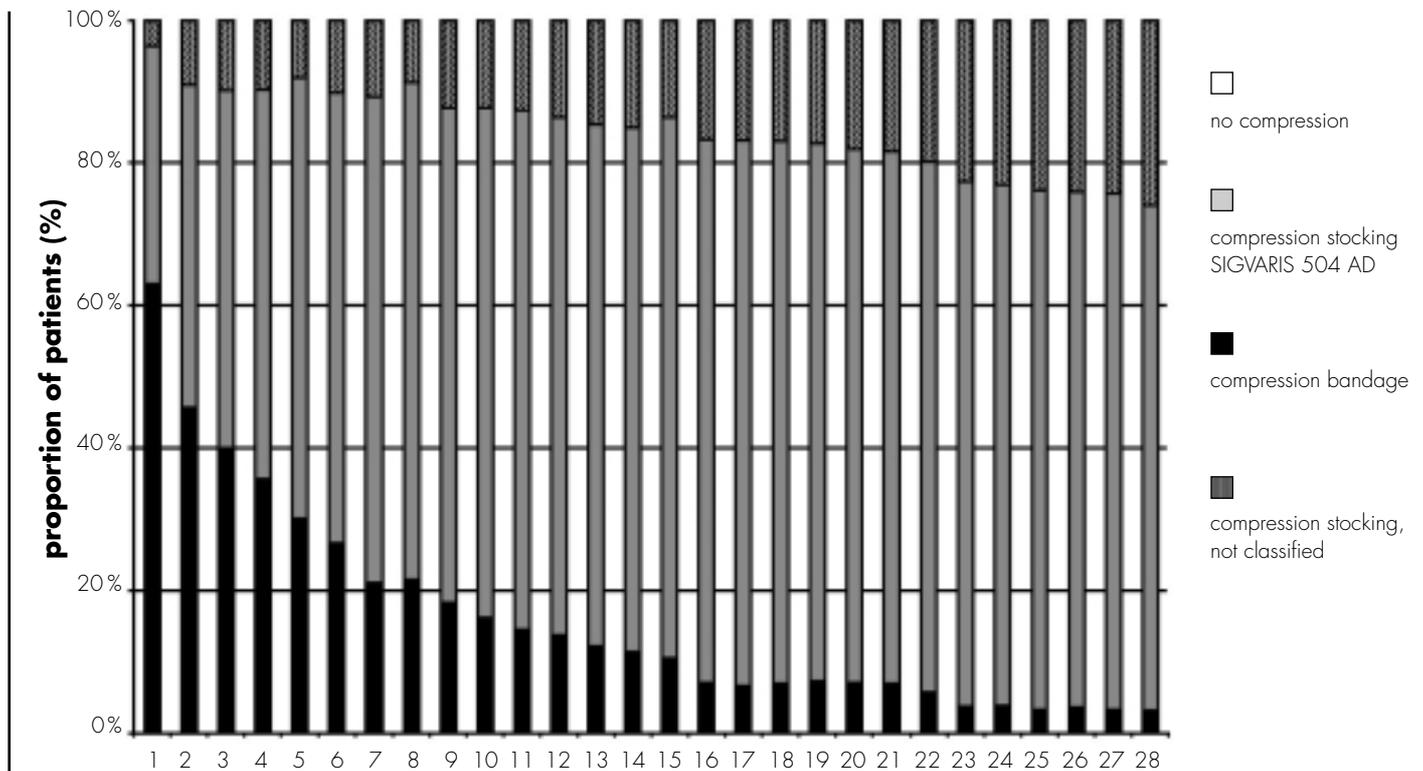


Fig. 1: Compression treatment during the KAB – study

Chapter: 10

Lit.: 28/6

Lang.: GER

Sum.: ENG

McDaniel HB, Marston WA, Farber MA, Mendes RR, Owens LV, Young ML, Daniel PF, Keagy BA
Recurrence of chronic venous ulcers on the basis of clinical, etiologic, anatomic, and pathophysiologic criteria and air plethysmography

J Vasc Surg 2002;35:723-8

Aim

To assess the recurrence rate of venous ulcers after healing depending on the CEAP criteria, amount of global venous reflux, surgical correction of reflux and on the compliance with compression hosiery.

Methods

99 legs with active venous ulcers (C6) were examined using clinical, etiologic, anatomic and pathophysiologic criteria (CEAP), by standing Duplex ultrasound scanning and by air plethysmography (APG). High pressure compression protocols were used until the ulcers were healed. After ulcer closure all patients underwent treatment with 30-40 mm graded knee-high stockings. Surgical correction of venous reflux was done in appropriate conditions, in total 36 procedures, e.g. autologous vein transplant for deep venous incompetence (7), stripping of the great saphenous vein (26), isolated perforator surgery (2). Patients were followed at a maximum of 6-month intervals for ulcer recurrence, the mean follow – up time was 28 months.

Results

Ulcer recurrence rate was 37 % at 3 years and 48 % at 5 years. Patients who underwent surgery had a significantly lower recurrence rate (27 % + 9 % at 48 months) than did those without surgery (67 % + 8 % at 48 months, p=.005). Patients with deep venous insufficiency (n=51) had higher recurrence rates than those without (66 % + 8 % vs. 29 % + 9 % at 48 months, p=.006). A patient with deep venous insufficiency and a venous filling index of more than 4 ml/s has a 43 % chance of recurrent ulceration at 1 year and of 60 % at 2 years. Venous reconstruction can be considered in these cases. The factors found to increase the risk of recurrence were the recurrence of pain, presence of deep venous disease, an increased venous volume and venous filling index (APG) and the lack of surgical treatment of CVI.

Conclusion

Ulcer recurrence is significantly increased in patients with deep venous insufficiency and in patients who do not have venous abnormalities corrected surgically.

Comment

To keep an ulcer closed is frequently more difficult than to heal the ulcer. In this study the authors give us practically very important information especially regarding the potential benefits of surgical repair of refluxes. In contrary to several previous reports the authors could not find a strong correlation between compliance with compression hosiery and ulcer-recurrence. Based on the relatively small reduction in the recurrence rate they calculate that 749 observations would

be necessary to adequately determine significance. This could be a realistic figure for a future multicenter trial to proof the efficacy of compression stockings for prevention of ulcer-recurrence.

Chapter: 10

Lit.: 17/3

Lang.: ENG

Sum.: ENG

Jungbeck C, Peterson K, Danielsson G, Norgren L.

Effects of Compression Hosiery in Female Workers with a Standing Profession

Phlebology 2002;16:117-20

Background

The risk of developing chronic venous insufficiency may be greater for people having a standing profession. Compression may reduce swelling due to capillary leakage and white blood cell trapping and activation, which leads to inflammation and skin changes on the lower leg.

Aim:

To evaluate subjective symptoms and venous function before and after 4 weeks use of compression hosiery (20-30 mmHg).

Methods

52 female volunteers, mean age 42,5 years were included: 36 employed in department stores, hotel reception and restaurant kitchens, 16 belonging to the surgery staff, mainly serving as scrub nurses. 48 (96 legs) could be evaluated before and after 4 weeks of treatment. Subjective symptoms assessed by a visual analogue scale (VAS) were pain, ankle swelling, tired/heavy leg, restless leg and calf cramps at night. Foot volumetry was used to measure venous function before and after work on the day of inclusion and 4 weeks later after work.

Results

26 volunteers wore the stockings every day, 12 did not use them for 1-4 days and 10 did not use them for 5-14 days. After 4 weeks the VAS scores of the subjective symptoms were statistically significantly reduced. The foot volume increased significantly during the working day but was significantly reduced with the use of compression stockings after 4 weeks (mean change 15 ml). Expelled volume as a parameter of venous pumping capacity and refilling flow signifying reflux increased during the first day of investigation. After 4 weeks with compression expelled volume was significantly increased and refilling rate was significantly decreased compared to the values after work on the day of inclusion.

Conclusion

Compression treatment reduces lower limb symptoms following standing work and diminishes the refilling rate, which is a parameter for venous reflux using foot volumetry.

Comment

This study clearly demonstrates a beneficial effect of compression stockings both on subjective leg complaints and on objective parameters characterizing venous function. Although foot volumetry is not an ideal instrument to measure absolute changes of foot volume a statistically significant volume reduction after 4 weeks with compression could be demonstrated. An interesting finding is the increase of venous filling rate as a parameter of venous reflux at the end of the working day before therapy and the regression after 4 weeks using compression stockings. It has to be underlined that this study has very broad implications regarding occupational medicine, since it shows subjective and objective improvement by compression in a population of female workers having a standing profession and not in a group of patients suffering from venous insufficiency.

Chapter: 9

Lit.: 8/1

Lang.: ENG

Sum. ENG

Korn P, Patel ST, Heller JA, Deitch JS, Krishnasastri KV, Bush HL, Kent KC.

Why insurers should reimburse for compression stockings in patients with chronic venous stasis

J Vasc Surg 2002;35:950-7

Background

Medicare and other insurers pay for the treatment of venous stasis ulcers and their sequelae but are unwilling to reimburse for measures designed to prevent ulceration.

Aim: To demonstrate the cost-effectiveness of a strategy of reimbursement for compression stockings and education versus a regimen that does not supply these resources.

Methods

A Markov decision analysis model following a hypothetical cohort of 55-year-old patients with a history of previous venous ulceration was used, either provided with prophylactic compression stockings and education or neither of these resources. The cohort is followed until all patients have died. Based on references from the literature the following probabilities are assumed: Mean time to ulcer recurrence: 53 months with compression and education, 18,7 months without prophylaxis, mean time for ulcer-healing: 4,6 months, probability of hospitalisation after development of an ulcer 12 %, of amputation 0,4 %. Costs for compression stockings per year were assumed as \$ 300.-, for nursing education \$ 40.-, for additional education at time of ulcer recurrence \$ 40.-, for ulcer treatment \$ 1621/recurrence.

Results

Compression stockings and education are cost-saving, with 0,37 quality adjusted life years and \$ 5904.- saved, absence

of work not included into this analysis. A program that includes compression stockings and education saves \$ 6326.- during the lifetime of each patient. Even more expensive modes of compression therapy could be used as cost effective alternatives in patients who have difficulty applying compression stockings.

Conclusion

Secondary prophylaxis after healing of venous ulceration using compression stockings and education is cost saving, even with the most conservative of assumptions. Insurers should routinely reimburse for these interventions.

Comment

In the USA 78 % of patients reported expense as reason for their non-compliance with compression stockings. This is probably different from most of the Western European countries, in which lack of clear advices and of education seem to be the main causes for non-compliance.

Chapter: 9

Lit.: 29/0

Lang.: ENG

Sum. ENG

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