Adherence to the Use of Compressive Therapy in Varicose Veins: A Review Article

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ARTICLE INFO
Article History
Submitted: 10 June, 2023
Accepted: 27 June, 2023
Published: 8 August, 2023

Source of support: None
Conflict of Interest: None

ABSTRACT

Varicose veins (VV) are engorged veins mainly found in the peripheral regions. The presence of varicosities is not only a cosmetic problem but results in discomfort, loss of working days, disability, and health-related quality of life. Compression therapy is the most widely used conservative treatment for VV. Its effectiveness depends upon patient adherence. Here, we discuss the various modes of compression therapy and the factors affecting its adherence among varicose veins patients.

Keywords: Compression bandages; Compression stockings; Patient compliance; Treatment adherence; Varicose veins.

INTRODUCTION

Varicose veins (VV) are engorged veins mainly found in the peripheral regions. They occur due to incompetent valves that lead to blood pooling and raised venous pressure and can cause pain, itchiness, hyperpigmentation, and ulceration.[1,2] VV falls under the C2 category of the CEAP (clinical, etiology, anatomy, pathophysiology) classification system of chronic venous diseases.[3] Varicose veins(VV) are engorged veins mainly found in the peripheral regions. They occur due to incompetent valves that lead to blood pooling and raised venous pressure and can cause pain, itchiness, hyperpigmentation, and ulceration.[1,2] VV falls under the C2 category of the CEAP (clinical, etiology, anatomy, pathophysiology) classification system of chronic venous diseases.[3] The intervention options for VV are pharmacological (sclerotherapy, phlebotonics, and O-Beta-hydroxyethyl rutoside), non-pharmacological and surgical. Non-pharmacological interventions includephysical therapy, compression therapies, and rest.[6]

Compression therapy is the mainstream treatment for venous leg ulcers and to alleviate venous symptoms in patients with chronic venous diseases (level of evidence grade1B).[7,8] It is the most widely used treatment intervention for VV along with some lifestyle changes including weight loss, exercise and leg elevation whenever possible.[4,9] The compression is applied at the pressure of 20-30mm Hg with a decreasing gradient from ankle to thigh.[10] The main aim of compression therapy is to reduce venous symptoms without compromising arterial functions. The benefits of compression therapy depend on patient adherence.

In this paper, we review the role of compression therapy in the management of VV and summarise factors that affect adherence to this treatment intervention.

Types of compression therapy:

Compression therapy broadly includes the use of bandages and compression stockings to achieve a pressure of around 20-30mm Hg.[8] A summary of the pros and cons of these two modalities is presented in Table 1.

Table 1. Pros and cons of different types of compression therapy

Type of compression therapy	Pros	Cons
Elastic bandages (elasto-crepe)	• Cost-effective • Can be reused	• Applied incorrectly by the patient, • Tends to lose, • Interrupted compression delivered.[8]
Crepe bandages	• For holding the dressings	• Pressure delivered is too low, 40-60% pressure loss in first • 20 min of application.[8]
Multilayer bandages	• Comfortable • Can be used for a week • Protects against trauma • The pressure distribution is even • Adequate balance between resting/ working pressures, useful for bigger legs and • Active patients	• Needs to be applied by well-trained personals.[8]
Compression stockings Class I (18-21 mm Hg) Indicated in mild varicosis, early varicosis in pregnancy and heaviness of leg Class II (23-32 mm Hg) Indicated in severe varicose veins, moderate edema, pronounced varicosis in pregnancy, post healing minor ulcerations, superficial thrombophlebitis and post sclerotherapy Class III (34-46 mm Hg) For severe chronic venous insufficiency, marked edema and induration of skin	• Increases venous refilling time, • Improves the pumping action of the calf muscle • Size of the stocking can be measured and prescribed accordingly	• Difficult to put on, particularly in patients with arthritis.[8]

Bandaging techniques include the application of single layer or multilayer bandages on the affected limb using short to medium stretch. The bandage produces eccentric compression on the limbs and can be with or without cotton rolls to produce an effective pressure.[10,11] Multilayer bandages have shown to be more effective as more layers provide better compression. The spiral and figure of 8 patterns of bandaging have been the traditional ways of bandaging (shown in Figures 1 and 2) however, the rationale behind these is still unclear. [12]

Elastic compression stockings are an alternative to bandaging. The stockings may be thigh-length or knee-length and provide the optimum pressure necessary to increase the blood flow and promote venous return thus reducing capillary filtration.[3,13,14] Elastic compression stockings work better when combined with movement of the limb such as walking and exercise. During walking, the non-yielding stiff material exerts a massaging effect to the leg and increases the expelled volume of the calf pump. This helps to compensate for ambulatory venous hypertension.[15]

How does compression therapy work:

The main rationale behind the use of compression in VV is the difference in intravenous pressure in the leg during supine and standing positions. The intravenous pressure at

the ankle is low in the supine position, and due to the pooling of blood in the legs during standing rises to 80-100 mm Hg. In a healthy person, the contraction of the calf muscles is responsible for reducing this pressure. However, in a person with VV, this mechanism is compromised due to incompetent valves. Compression helps in venous return and reduces ambulatory venous pressure by effectively shifting the fluid from the interstitium into the lymphatics. It also reduces the radius of the veins and increases the velocity of the flow thereby reducing the levels of inflammatory cytokines and promoting ulcer healing. Therefore, the use of compression therapy is vital for patients with VV. [16]

Figure 1. The figure of 8 bandaging
Figure 2. Spiral Bandaging

Factors affecting adherence to compression therapy:

The term adherence is used when the patient's action matches the health care professional's recommendation. In clinical practice, the adherence of the patient to the use of stockings and bandages is vital to their effectiveness. and non-adherence can potentially lead to decreasing the benefit of the intervention.[13] Previous studies on VV report that 63% to 71% of the participants did not comply with the recommended use of compression stockings[17] and among the participants that reported using compression stockings- only about 10% use it on a daily basis.10 In a study, 15% of the elderly couldn't apply stockings.[16]

Some factors that led to poor adherence to compression therapy are:

- Pain and discomfort while wearing stockings.
- Difficulty applying and taking off.
- Less knowledge and understanding of the condition (considering it as a minor disease), previous negative experiences regarding the treatment process, and lack of trust in health care professionals due to poor communication.
- Tight compression affects the limb temperature and causes it to rise. Hence, compliance is reduced in hot and humid climates.
- Produced more itchiness while wearing it.
- In patients especially in females, if there is disproportionate obesity of thighs, proper sizing is not possible which can also reduce compliance.
- The shorter stature of limbs makes the length of the below-knee go above it and thus making compression ineffective and reducing compliance.
- Barefoot walking is still prevalent in countries like Nepal and India, which can cause wear and tear to the stockings.
- Patients do not believe that compression is effective. [3,9,18,19,20]

In the case of bandages, the factors responsible for poor adherence were the pressure delivered by it was less than the required amount which might be because of the poor application by the caretaker, slipping of bandage is often bothersome and requires reapplication. Also, the bulkiness creates difficulties wearing shoes, reducing ankle mobility and causing more discomfort.[14] These factors led to disease progression causing a cascade of symptoms such as venous ulcers and secondary edema.[9] In contrast, a high percentage of adherence to the use of stockings is also well documented. In a study where nurses were asked about their adherence to the use of stockings, 66% reported having high adherence to it.[21] It might be because of the fact that they were aware of the condition and the importance of compression therapies.

DISCUSSION

Compression therapy is the mainstay conservative treatment for venous diseases. This review identifies the factors responsible for the poor adherence to compression therapies. Pain and discomfort is still a major barrier to treatment effectiveness. Also, clinicians should counsel patients adequately regarding compression therapy and work in close conjunction with the physiotherapy team to achieve desired results. They should properly evaluate the educational status of the patient and focus on counselling about its importance. Both verbal and written instructions can be given to the patient for reinforcement. If the companies can modify the material of the stocking,

probably the discomfort experienced by the patient can be less and people can benefit from it. Also, in order to improve adherence to compression therapy, in selected patients, we can advise for use of adjunctive contraptions to help wear compression stocking if it's available.

CONCLUSION

However, studies focussing on this aspect and searching for better material are needed for this. Also, studies in our setting regarding patient adherence to compression therapy with larger populations and longer duration are highly recommended. Studies comparing adherence to conventional compression therapy with newer aero warps will be helpful.

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