

A Compression Kit of a Stocking and Three Superimposed Leggings Is Easy to Don and Dose Adjustable

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WHAT THIS STUDY ADDS

A compression stocking kit composed of an understocking and superimposable leggings is easier to don.

Background: Forty percent of patients with chronic venous insufficiency (CVI) do not wear their indicated and prescribed compression stockings. Difficulties in donning and a feeling of constraint are the most common reasons for non-adherence.

Objective: The aim was to develop a compression stocking system that is easy to don and dose adjustable.

Methods: A modular compression stocking kit composed of an understocking and three superimposable leggings (SLLs) was developed. Substocking pressures (P) at the thinnest part above the ankle (cB level) were 17 mm (understocking) + 15 + 10 + 10 mmHg (3 superimposed leggings; Hatra method). Twenty healthy subjects and 20 patients over 65 years with CVI donned the SLL compression kit. P was measured in vivo (Picopress method) at the transition of the Achilles tendon to the calf muscle (level cB1) during rest and ankle movements (DSI; dynamic stiffness index) and compared with a strong compression stocking of 40 mmHg (S40).

Results: Twenty (20/20) patients aged over 65 with CVI (C4–6) successfully donned the SLL compression kit without aid, compared with 12 (12/20) who were able to don the S40 without aid ($p = .02$). *In vivo* resting P at level cB1 was 34.3 mmHg (SLL) compared with 37.3 mmHg (S40) ($p = .1$). The DSI was 16.1 (SLL) compared with 17.9 ($p = .79$; S40; CVI group).

Conclusion: The physical properties of the SLL compression stocking kit correspond to the characteristics of a strong stocking at rest and exercise (DSI). The donning success rate is excellent (100%). A further potential advantage is that the SLL leg compression kit is dose adjustable, according to indication or patient tolerance.

Wearing comfort over periods of several days and clinical effectiveness need to be investigated in future trials.

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INTRODUCTION

Compression therapy is pivotal in the treatment and prevention of chronic venous insufficiency (CVI). Its effectiveness in the treatment of venous leg ulcers (VLUs), prevention of VLU recurrence and of post-thrombotic syndrome (PTS) has been empirically proven by a number of high quality methodology clinical trials over the last two decades.^{1–5} Moreover, compression therapy alleviates pain and improves quality of life.⁶

The advantages of compression stockings and multilayer compression bandages with an outer layer of a cohesive bandage are that they do not change their physical properties or lose interface pressure over one or more days of wear.^{7,8} Stockings are as effective as compression bandages in the treatment of uncomplicated VLUs with a diameter <5 cm.⁹ Several companies have developed ulcer stocking kits composed of a light understocking to be kept on day and night which keeps a wound dressing in place, combined with a strong overstocking which provides effective compression during the day. The overstocking glides more easily over the understocking than over skin. Despite the considerable technical progress in the production of compression materials, compliance with compression therapy has been found to be around 60%,^{10,11} leaving a gap of 40% of patients who cannot or do not comply with compression therapy, the fundamental treatment of CVI. Difficulties in donning the stockings, a feeling of constraint,

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