Exploring the effectiveness of compression garments in patients with orthostatic hypotension

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Introduction

Orthostatic hypotension (OH) , also called postural hypotension is defined as a sudden drop in blood pressure upon standing from a sitting or supine position. Clinically, this is diagnosed by a sustained reduction in systolic blood pressure of at least 20 mmHg or diastolic blood pressure of 10 mmHg within three minutes of standing after being supine for five minutes (Ringer and Lappin, 2017). OH can occur in anyone but is more commonly found in people who are elderly or have underlying health conditions such as Parkinson's disease and diabetes.

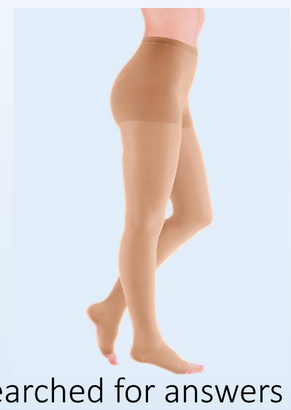
Other factors that can cause postural hypotension are:

Tachypnea	Overheating
Dehydration	Medications
Anaemia	Acute illness

Aim

Following an increase in referrals received by the Orthotic department, Greater Glasgow and Clyde for patients with a diagnosis of postural hypotension, I decided to research evidence that would support orthotic treatments (Figures 1 and 2) effectiveness with a view to support an informed evidence based clinical prescription.

Left Figure 1. elastic binder Right Figure 2. compression tights. Image rights obtained from Medi UK



Objectives

To research all available treatment options for OH. Questions I searched for answers and supporting evidence were….

- What orthotic treatment options are available for this condition?
- Does compression grade make a difference in effectiveness?
- Is there evidence to support compression garments as an effective treatment choice?
- What are the contraindications to be considered before prescription?

Research Method

A search was carried out through CINAL, Medline and the Cochrane library with additional sources checked through paper references, the knowledge network and the GCU library.

Duplicates were removed and the inclusion and exclusion criteria was applied to the search to narrow down to 12 relevant sources.

Inclusion	Exclusion
Published within past ten years	Foreign language
Systolic Blood pressure measured	Geographical source
Orthotic intervention used	No access to full paper

References

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Key Findings

Only one study measured a reduction in symptoms of OH using compression therapy as the sole treatment (Caporasco et al., 2009), more often than not, compression measures are used in conjunction with lifestyle changes and pharmacological intervention.

Leg Compression – Multiple papers state that lower limb compression alone is ineffective in preventing a drop in blood pressure. This is thought to be because the venous compartment of the lower limbs is smaller than that of the splanchnic region in the abdomen. Lower limb compression for treatment of OH is recommended to be 30-50mmHg (Ricci et al., 2015).

Abdominal Compression – Abdominal compression using an elastic binder is effective in reducing the drop in blood pressure when standing. This is thought to be because the venous beds in the abdomen form the largest of the body's blood pool, approx. 20-30% volume meaning venous return is maximised. Recommended compression is 20mmHg- 30mmHg (Ricci et al., 2015)

One major limitation is in compliance. "Non pharmacological therapies are preferred over medications by older people with orthostatic hypotension, however their use is limited due to poor tolerability" (Robinson et al., 2018)

Pros

- Immediate effect on hypotension with effects felt by patient
- Can be used as required
- Can in some cases eliminate need for pharmacological intervention

Cons

- Donning can be difficult for patients with upper limb dexterity issues
- Can be warm to wear in varying seasons
- Difficult to measure exact pressure being applied to abdomen in a binder
- Garments require regular replacement to ensure guarantee of compression class
- For lower limb compression an ankle brachial pressure index assessment is required, this is not always readily accessible

Contraindications must be considered when prescribing compression garments (NICE, 2022). Lower limb compression is contraindicated for patients in heart failure and peripheral arterial disease. Careful consideration should be given before prescription for patients with sensory neuropathy and active infections such as cellulitis. For Abdominal compression, consideration should be given for patients with wounds, abdominal hernias, gastric conditions and abdominal aortic aneurysms.

The evidence suggests that compression in any form reduces the effects of OH, however one paper indicated that leg compression alone is ineffective and abdominal compression should be used in the first instance. That said, patients reported improvement with leg compression alone (Gibbons., 2017). The findings cannot be easily implemented to practice as had adjunct interventions.

Conclusion

Compression stockings alone are only effective in the treatment of OH if worn at waist height (tights) the level of compression required to be effective is normally not tolerated and is fraught with various barriers to prescription such as physical ability, medical conditions, sizing. Abdominal compression by itself has been shown to be effective in small study groups to reduce postural blood pressure drop, these garments are usually off the shelf and easily prescribed with donning/doffing being more manageable than hosiery. Adopting a "higher the better" (Ricci et al. 2015) approach it would be appropriate to prescribe an abdominal binder in the first instance with evidence to support this as an effective treatment method. That said, relevant evidence sourced was limited and further review comparing interventions would be of benefit.

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