Automated Inflatable Binder to Counter the Effects of Orthostatic Hypotension

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Summary

Orthostatic hypotension (OH) is a chronic, debilitating illness that can cause instability and dizziness upon standing, leading to increased risk of injury from a fall. OH affects millions of people every year, especially the elderly, hindering movement and physical activity and, in the worst cases, causing syncope or death. OH and impaired orthostatic tolerance are caused by gravitationally induced pooling with decreased venous return. By decreasing abdominal venous pooling, OH can be decreased and upright blood pressure and orthostatic tolerance can be improved. Unfortunately, treatment of OH with pressor medications can worsen supine hypertension, cause drug interactions, and may be contraindicated in patients with cardiovascular disease. Elastic binders have been used to treat OH in the past, but the binder tension is applied by the patient and it is difficult for them to achieve an effective pressure. Inflatable back support binders are also available, but are not electrically driven or automated. Thus there is a need for a non-drug, automated treatment for OH such as the binder presented here.

Technology Description

Vanderbilt scientists have developed an automated inflatable abdominal binder that can detect when a patient moves from a prone or sitting positon to a standing position and automatically apply a sustained servo -controlled compression pressure in order to counter the effects of OH. The binder is as effective as conventional drug therapy in controlling OH, without subjecting patients to potentially harmful side effects and interactions with other medications.

Technology Features

- Fully automated: no need for caregiver to assist with using the binder
- As effective as conventional medications
- Controlled by a mobile device

Intellectual Property Status

- A Patent Application has been filed: US20150313608

Publication: Okamoto LE, Diedrich A, Baudenbacher FJ, Harder R, Whitfield JS, Iqbal F, Gamboa A, Shibao CA, Black BK, Raj SR, Robertson D, ***Biaggioni I****. Efficacy of Servo-Controlled Splanchnic Venous Compression in the Treatment of Orthostatic Hypotension: A Randomized Comparison With Midodrine. Hypertension. 2016 Aug; 68(2): 418-26. PMID: 27271310, PMCID: PMC4945429, PII: HYPERTENSIONAHA.116.07199, DOI: 10.1161/HYPERTENSIONAHA.116.07199, ISSN: 1524-4563.*

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