INVITED COMMENTARY

Low Interface Pressure Provides Major Part of Hemodynamic Response to Compression Therapy

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The current state of knowledge regarding compression therapy makes any new publication addressing this therapeutic modality a valuable contribution. It is especially true when the authors are renowned subject matter experts such as Mosti and Partsch.[1] Unlike other studies that simply compare new against established devices, the authors used the opportunity presented by newer technology to address more fundamental questions of compression therapy. The new device automatically increases pressure in the standing position, mimicking high static stiffness index (SSI) - the change in the interface pressure (IP) after moving patient from supine to standing position. The authors chose not to match the IP and SSI of newer devices with similar parameters of compression bandages. Instead they used elastic stockings, making it possible to examine the relationship between the IP, SSI, and the haemodynamic effect of compression.

At first glance this study just confirmed what is already known — that a higher IP has a greater effect on the ejection fraction (EF). A closer look at the data reveals an intriguing observation that the relationships between the IP, SSI, and EF are grossly non-linear. The SSI of compression stockings was just 3 mmHg. The new device produced SSI of 24 mmHg, or 32 mmHg with different wraps. While elastic stockings provided the lowest increase in IP, they had the highest magnitude of haemodynamic effect, increasing EF by 10.1%. It was necessary to deliver 8.3 times higher pressure increase to achieve an additional 18% EF increase, and 11 times greater increase in pressure to achieve a 39% increase in EF.

As with any good study, this report posts several important questions. Included patients had large and incompetent GSVs, and competent deep veins. Is increasing ejection of blood from the calf, most of which comes from the deep veins a desirable haemodynamic effect? How much recirculation occurs through the incompetent thigh GSV after the cessation of exercise? More importantly, how do the observed haemodynamic effects translate into clinical outcomes?

The major practical aspect of any compression device is patient acceptance and compliance. The appearance of a compression device is frequently misleading in this regard. Velcro devices, for example, look less attractive than compression stockings, but have high patient compliance. Obviously, the acute experimental setting of this study cannot assess patient comfort and compliance with wearing the new device. It is especially true when patient self reporting is used as the measuring tool. Randomised trials have shown that patient self reporting not only significantly overestimates objectively measured use, but also positively biases towards newer devices.[2,3]

Finally, this paper showed that lower IP is responsible for the major part of the haemodynamic response to compression. The same authors have shown previously that the degree of oedema reduction by low IP is the same, if not better, than by higher compression. Based on these observations one should reasonably question the rationale for use of expensive complicated compression devices with higher IP and SSI at least in some patients.

REFERENCES

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