Hysteresis and medical compression bandage and stockings

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Introduction

The word *hysteresis* comes from the Greek *husteros*, which means *lagging behind*.

We can observe it in natural phenomena like electricity and magnetism.

Hysteresis is a well-understood phenomenon in relation to medical compression bandages (MCB), but remains poorly studied regarding medical compression stockings (MCS).

Materials and Methods

Two different MCB (long-stretch and short-stretch) and three MCS were used for this *in vitro* experiment.

Compression measurements were taken using a French dynamometer. Therefore this enabled comparison of the hysteresis curves to be studied.

Results

As it is known short-stretch bandage produces a concave curve. As it is not very well-known Long-stretch bandage produces a convex curve.

The curve obtained with the MCS is also convex, relatively similar to that obtained with the long-stretch bandage. As stretching starts the pressure increases very fast. Then the pressure decreases for becoming nearly horizontal.

Pressure and resistance (the *in vitro* stiffness) can be obtained at any point on this curve.

Discussion and Conclusions

For MCB, more precise studies should be performed taking into account the number of turns applied. However theses results support previous studies by demonstrating the convex hysteresis curve contour for long-stretch bandages recently described in the literature.-

For MCS, Hysteresis curves give the relationship between the size of MCS (or patient ankle perimeter in cm) and pressure delivered, *i.e.* the correct *dosage* for a given situation.[1-3]

So: i) correct prescription of stockings would be facilitated if manufacturers would provide the hysteresis curves for each of their stocking's model; ii) such measures would also help avoid the use of compression class systems, which vary significantly from country to country.

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Veins and Lymphatics 2017; 6:6621
doi:10.4081/vl.2017.6621

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