

## **The Impact of Intermittent Sequential Pneumatic Compression (ISPC) Leg Sleeves on Cardiac Performance**

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**Background:** The use of an ISPC device on patients during laparoscopic operations is known (as was demonstrated by means of esophageal Doppler) to overcome cardiovascular pathophysiologic changes that might occur during positive pressure pneumoperitoneum.

Our goal was to study the underlying mechanism behind the physiologic changes that might follow the activation of ISPC on healthy volunteers, and its significance concerning related pathophysiologic phenomena.

**Materials and methods:** Twenty healthy volunteers underwent trans-thoracic echocardiographic evaluation before and during activation of ISPC device. The pneumatic sleeves (Mego-Afek, Lympha-press) were each composed of 10 consecutive air cells, sequentially inflated to a pressure of 50 mmHg, twice per minute. Every patient served as its own control.

**Results:** Cardiac output ( mean 5.145 to 5.465 l/min , p-0.0495) and stroke volume (mean 72.35 to 77.95 ml, p-0.002), as well as ejection fraction ( mean 59.86 to 68.89%, p-0.041), velocity time integral of aortic flow and shortening fraction of left ventricle, were significantly increased following ISPC activation, without reciprocal increase in heart rate. Increased venous return and improved contractility were manifested by positive changes in the parameters that express increased flow to the ventricles during diastole, as well as changes in diastolic and systolic left ventricular dimensions. Tissue Doppler imaging were compatible with normal cardiac responses.

**Conclusions:** Activation of ISPC device caused increased cardiac output due to increased preload. Such data may explain the mechanism related to the beneficial use of ISPC during laparoscopic operations, and may serve as an experimental model of increased cardiac activity, and should be further studied in the context of patients suffering from cardiac diseases (such as failure).