

## Intermittent pneumatic compression in stable claudicants. Effect on hemostasis and endothelial function

Sutkowska E, Wozniowski M, Gamian A et al (2009)  
International Angiology 28: xx-xx

### Overview

Claudicants were treated for three weeks with Intermittent Pneumatic Compression (IPC) using the *Flowtron® Plus* system. Application was one hour per day for five days each week; outcomes measures were the effect upon coagulation status and walking distance. IPC was found to be safe and effective, significantly prolonging walking distance and improving endothelial health.

### Design and methodology

This prospective controlled study set out to determine if changes in coagulation activation, endothelial cell damage, platelet factor 4, thrombin-antithrombin complex, nitrate and nitrite and von Willebrand factor concentrations were associated with IPC used in both claudicants (n=25) and a cohort of healthy volunteers (n=11) of similar age and sex. Claudicant subjects were already enrolled in an ischaemic leg exercise therapy programme that was undertaken three times per week. Both pain free walking distance and maximal walking distance were determined before and after the 3 week period. IPC was administered for 1 hour, five times per week for 3 weeks using the *Flowtron Plus* full leg sized garments using a cycle of 30 seconds inflation followed by 15 seconds deflation. Inflation pressure was adjusted individually to 10mmHg higher than the patient's diastolic BP. Blood testing was undertaken at baseline, before IPC, after first, fifth and fifteenth session of IPC and then 3 weeks after completion of treatment.

### Results

Pain free Walking Distance (PWD) continuously and statistically increased throughout the 3 weeks of IPC highlighting that the treatment is clinically effective. Even 3 weeks after cessation of IPC, PWD was still significantly longer than at baseline.

Both nitrates and nitrite levels were lower in claudicants compared to control subjects and IPC therapy caused levels to rise in both groups suggesting that limb compression induces endothelial nitric oxide release.

Von Willebrand Factor (VWF) did not increase in the claudicants throughout the period of IPC usage; this indicates that IPC stimulates endothelial cells but does not stress them. The 3 weeks of IPC therapy reduced the activity of the platelets and coagulation system as indicated by levels of PF4 (a measure of platelet activation/secretion) and thrombin-antithrombin complex.

### Conclusion

External compression of ischaemic legs is safe, reduces platelet activation, does not activate coagulation and increases walking distance of claudicants. It is likely that IPC induces increased release of endothelial nitric oxide that improves leg circulation.

*The Flowtron Plus is a registered ArjoHuntleigh product. The Flowtron Plus has now been updated to the Hydroven® Therapy range.*

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