Common peroneal nerve stimulation reduces blood sludging in the popliteal vein standing and lying

Abstract No:

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Authors:

M Azzam[1], E Kalodiki Institutions: [2]

[1]Vascular Specialist, Imperial College, London, Middlesex, United Kingdom, [2]Ealing Hospital, Josef Pflug Vascular Laboratory, Middlesex, United Kingdom

Enter Objectives / Purpose Statement:

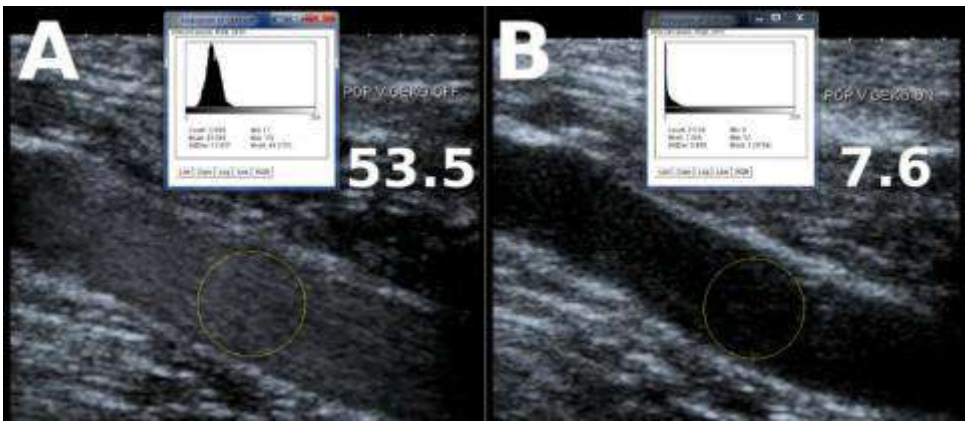
The common peroneal nerve stimulator (CPNS) is a UK approved device for reducing venous thromboembolism (VTE) risk. The hypothesis is that as blood flow slows, erythrocytes aggregate into ultrasound detectable echogenic particles. The aim was to determine whether the CPNS reduces stasis using the ultrasound derived venous sludge index (VSI).

Method:

Twenty-five healthy volunteers had their right popliteal vein video recorded (B-mode ultrasound at 22 frames per second) in longitudinal and transverse views, standing and lying. First with the CPNS off and then with the CPNS on. A single frame out of the possible 154 frames (7 seconds) was selected at random, for the image analysis. The VSI, a grey scale index (0-255), was used to quantify the 'brightness' of the erythrocyte aggregates within the circular sampling area.

Subject characteristics (IQR Inter-quartile range, PVD popliteal vein diameter)

	Median	IQR	Range
Age (years)	37	27 - 51	22 - 67
BMI	26.7	23.6 - 28.7	16.4 - 39.1
Calf circumference (cm)	380	357 - 399	310 - 440
Stimulator intensity (1-7)	6	5 - 7	3 - 7
PVD standing (mm)	10.3	8.7 - 11.3	8 - 14.2
PVD lying (mm)	9.9	8.2 - 11	7 - 13

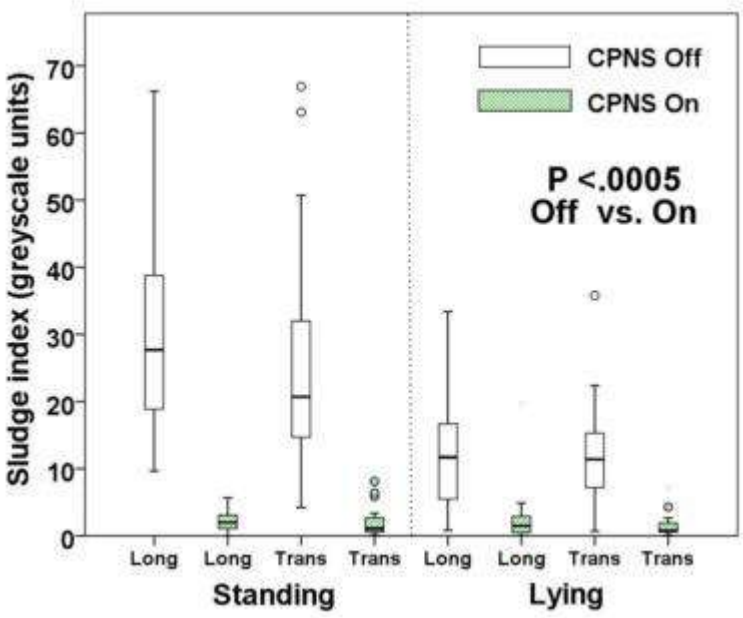


(https://www.aievolution.com/acp1601/files/content/abstracts/abs_1057/ImageAnalysisGeko.jpg)

·Image analysis of popliteal vein sludging demonstrating the sampling region as a faint circle. A) Stimulator off, VSI = 53.5; B) Stimulator on, VSI = 7.6.

Results:

Expressed as median [inter-quartile range]. On standing there was a significantly higher VSI (P <.0005) compared to lying (Longitudinal view: 27.7 [18.8 - 41.4] *vs.* 11.7 [5.5 - 17.5], Transverse view: 20.7 [13.6 - 32.2] *vs.* 11.4 [6.3 - 15.9]). As shown on the box-plots, activation of the CPNS significantly reduced the VSI irrespective of the subjects' position or the view of the transducer probe. Good correlations were observed with the VDI between the longitudinal and transverse probe positions.



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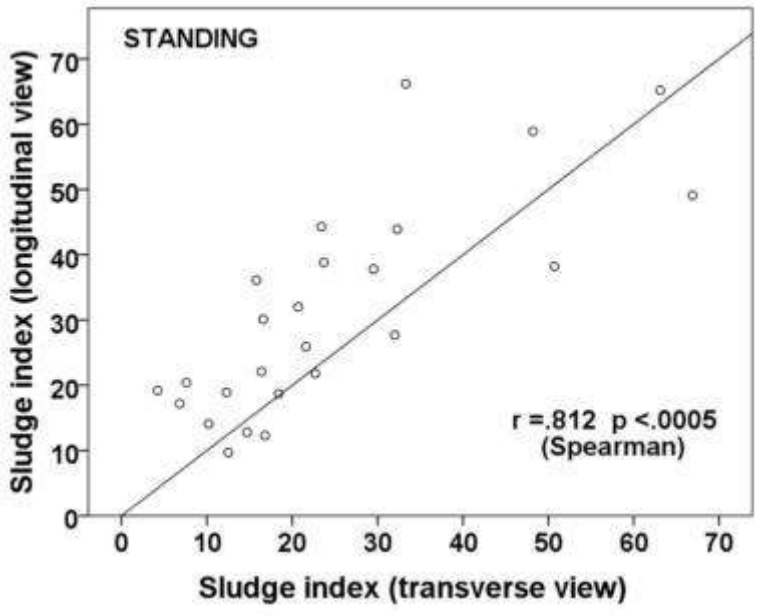
·The VSI compared standing, lying, longitudinal view and transverse view with the CPNS off and then on.



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·Correlation between the 2 ultrasound views in the derivation of the VSI.

Conclusions:

The CPNS device significantly reduces the VSI irrespective of whether the subject is standing or lying down. The relationship between erythrocyte aggregation, stasis and VTE risk requires more investigation.

Categories:

DEEP VENOUS THROMBOSIS