A New Look at Venous Hemodynamics: Measuring Reflux and Outflow Obstruction

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Disclosures: None

Historical Perspective
1. Hemodynamic testing was routine practice (AVP, PPG, Strain-gauge, APG) until the advent of duplex.
2. Subsequently, routine haemodynamic measurements were abandoned in favor of duplex.
3. Since then we repeatedly hear the statement: "there is a poor correlation between hemodynamic measurements and clinical severity of CVD.”

Questions to be Answered
1. What is the relationship between hemodynamic measurements (changes in volume, pressure and flow) and severity of chronic venous disease?
2. What is the significance of such a relationship.

Chronic Venous Insufficiency
Result of:
- Reflux (ml/sec)
- Obstruction (resistance: mmHg/ml/min)
- or both: Reflux and Obstruction

Air-plethysmography
Measures reflux (ml/sec)
Measures outflow resistance (mmHg/ml/min)
Simultaneous Pressure and Volume Recordings

26 Limbs with CVD

Nicolaides et al, Int Angiol 2014:33:275-81
Multivariable Regression

- Dependent Variable: VCSS
- Both VFI and R were independent predictors of VCSS (P < 0.001)

Predicted VCSS (or HI) = 0.33 + (VFI x 0.44) + (R x 158)

r = 0.83

Conclusions

1. There is a high correlation between the combined measurements of reflux and resistance (estimated VCSS or HI), and observed VCSS (r = 0.86)
2. The statement:
   "there is a poor correlation between haemodynamic measurements and clinical severity of CVD"
should be modified to:
   "there is a poor correlation between duplex measurements and clinical severity of CVD"