Background

- Coronary sinus blood flow (CSBF) can be used as a measure of total coronary blood flow.
- CSBF can be measured noninvasively using transthoracic echocardiography.

Hypothesis

- Decreased CSBF would be affected by obstructive coronary artery disease (CAD) and hemodynamic parameters affecting the coronary perfusion gradient.

Methods

- After informed consent was obtained, transthoracic echocardiograms limited to coronary sinus evaluation was performed and hemodynamic and clinical parameters were collected.
- CSBF (ml/min) was measured non-invasively as a product of heart rate, coronary sinus cross-sectional area (obtained in modified apical 4 chamber view), and coronary sinus time velocity integral (obtained in modified right ventricular inflow view).
- In patients with normal sinus rhythm and preserved atrial contraction, retrograde diastolic CSBF was subtracted from forward CSBF.
- Repeated measures ANOVA and chi-square analyses were used.

Results

- There was a trend towards decreased CSBF in patients with diabetes (647 +/- 507 vs. 937 +/- 685 ml/min in patients without diabetes, p=0.327) and/or obstructive CAD (663 +/- 381 vs. 832 +/- 748 ml/min in non-obstructive CAD or normal coronaries, p=0.613) and females (680 +/- 419 vs. 1095 +/- 828 ml/min in males, p=0.119).

Discussion

- In this prospective cohort study of patients referred for cardiac catheterization, we found that CSBF tends to be lower in patients with obstructive CAD.
- We also found a trend toward lower CSBF in patients with diabetes and/or HTN.
- Increased RA pressure was associated with augmented CSBF.
- We speculate that the effects of RA pressure on CSBF are reflective of preload and intrathoracic pressure parameters.
- Increased intrathoracic pressure may augment coronary blood flow by compression of the aorta thus improving the coronary perfusion gradient.
- Contrary to what might have been expected based on the coronary perfusion gradient, we found no significant correlation between CSBF and LVEDP.

Conclusion

- Coronary sinus blood flow is determined by patient morbidities and central hemodynamic parameters.

References: