LOW DIASTOLIC BLOOD PRESSURE IS ASSOCIATED WITH GREATER ODDS OF ANGINA IN PATIENTS WITH CHRONIC CORONARY ARTERY DISEASE

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BACKGROUND

- Blood pressure (BP) treatment is an effective strategy for cardiovascular risk reduction. Recent guidelines advocate a more aggressive BP treatment for cardiovascular risk reduction than previously recommended.
- Aggressive reduction of diastolic BP may be deleterious to the myocardium as coronary perfusion occurs during diastole. While prior studies suggest that low diastolic BP is associated with the risk of myocardial injury, there is limited information on the association of low diastolic blood pressure and angina risk in patients with CAD.
- Accordingly, we used a multicenter registry of outpatients with CAD to describe the association of diastolic BP with the presence of angina.

METHODS

STUDY POPULATION:

- The Angina Prevalence and Provider Evaluation of Angina Relief (APPEAR) study was a cross-sectional, observational study designed to quantify and assess angina and quality of life in outpatients with chronic CAD.
- Consecutive patients with a diagnosis of CAD (defined as stable angina, prior myocardial infarction, or prior coronary revascularization) were enrolled from 25 US cardiology outpatient practices between April 2013 and July 2015. Eligible patients included those ≥18 years of age who had ≥1 prior office visit to the practice.

ASSESSMENT OF ANGINA:

- Angina was assessed using the Seattle Angina Questionnaire (SAQ) Angina Frequency domain (AF), a reliable and valid 19-item self-administered, disease-specific health status questionnaire
- Scores range from 0-100, with higher scores indicating less angina, and were dichotomized into any angina (SAQ-AF score <100) versus no angina (SAQ-AF=100) over the past 4 weeks, congruent with prior work.

STATISTICAL ANALYSIS:

- Baseline characteristics across the DBP quartiles were compared using linear trend tests for continuous variables and Mantel-Haenszel tests for categorical variables.
- We used hierarchical, logistic regression model with site as a random effect to examine the association of DBP with the odds of angina, and then sequential adjusted for : age, sex, race, insurance status, education history, avoidance of care due to cost, body mass index, hypertension, diabetes, history of stroke or transient ischemic attack, history of myocardial infarction, chronic kidney disease, heart rate, calcium channel blockers, beta blockers and systolic BP.
- As restricted cubic spline terms were included for all continuous variables, a multiple degree of freedom test was calculated for the overall DBP effect, and a DBP of 80 mmHg was used as the reference.
- A p-value of <0.05 was considered statistically significant.

RESULTS

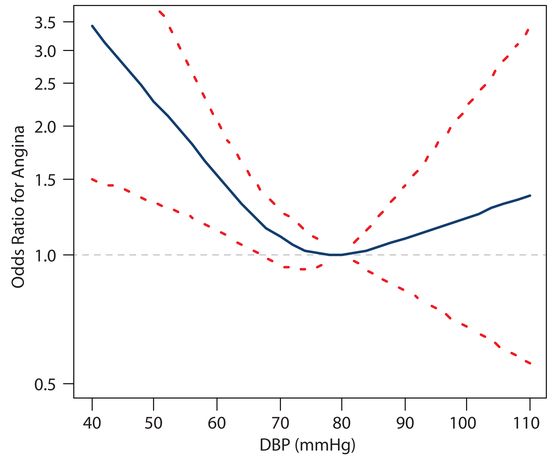
TABLE 1: BASELINE CHARACTERISTICS

	Q1: 40-64 n=309	Q2: 65-71 n=316	Q3: 72-79 n=278	Q4: 80-108 n=356	P-Value
Age, y	75.0 ± 10.5	72.2 ± 10.1	70.6 ± 11.1	67.3 ± 11.0	<0.001
Female, %	35.3	31.0	34.9	26.1	0.030
Race, %					0.139
White	87.1	91.1	91.7	89.0	
Black	3.6	3.8	3.6	5.9	
Other	9.4	5.1	4.7	5.1	
Avoid care due to cost, %	4.9	6.3	6.9	6.2	0.472
High school education, %	32.6	36.1	37.1	35.0	0.518
Heart rate, bpm	68.1 ± 11.7	69.5 ± 11.7	73.2 ± 56.9	70.0 ± 11.1	0.184
Systolic BP, mmHg	117.7 ± 16.3	124.4 ± 14.6	128.8 ± 13.2	139.1 ± 16.0	<0.001
Heart Failure, %	23.0	18.7	17.7	14.6	0.006
Current Smoker, %	6.6	9.6	12.1	12.0	0.014
Hypertension,%	77.0	80.1	79.8	81.7	0.161
Diabetes,%	35.9	39.9	33.9	32.3	0.147
History of stroke/TIA, %	7.4	7.6	7.9	7.6	0.918
History of MI, %	34.0	35.4	45.1	39.3	0.045
Chronic kidney disease, %	17.8	14.2	9.0	9.0	<0.001
BMI, kg/m²	29.6 ± 6.5	30.5 ± 6.4	30.6 ± 6.5	31.3 ± 6.2	0.001
Calcium channel blocker, %	26.9	26.9	21.6	27.5	0.851
Beta blocker, %	77.3	81.0	82.7	76.4	0.794
ACE inhibitor, %	35.3	40.2	38.8	37.4	0.722
ARB, %	27.2	20.9	23.7	26.1	0.960
Diuretic, %	51.1	42.7	36.3	34.6	<0.001
Nitrate, %	58.6	52.5	52.5	46.9	0.004
Ranolazine, %	7.4	6.0	7.9	2.8	0.027
Any angina in past month, %	37.0	33.7	29.9	30.3	0.045
SAQ Angina Frequency	90.0 ±17.5	91.1± 15.1	92.6± 15.3	92.4 ± 15.3	0.027

- In the unadjusted logistic regression model, diastolic BP was significantly associated with angina (p=0.017) with a J-shaped relationship (p for nonlinearity=0.027; Figure 1)
- After multivariable adjustment, including adjusting for SBP, DBP was associated with angina with DBP values lower than the nadir (around DBP 70 -80 mmHg) resulting in increased odds of angina (DBP p=0.045).

RESULTS

FIGURE 1: ASSOCIATION BETWEEN DBP AND ANGINA



CONCLUSION

- In a multicenter cross-sectional analysis of patients with stable CAD, we found that very low DBP was associated with an increased odds of angina.
- With recent guidelines promoting an aggressive blood pressure lowering paradigm, it will become increasingly important to individualize treatment strategies to minimize adverse events and maximize benefits.
- Prospective studies are needed to further examine the relationship between DBP and angina and to help guide management of patients with CAD and low DBP.

DISCLOSURES/COI

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