

Background

- Pregnancy in women with congenital heart disease (CHD) is associated with increased rate of adverse pregnancy outcomes and maternal morbidity and mortality
- B-type natriuretic peptide (BNP) is a useful biomarker in predicting heart failure and adverse cardiovascular events outside of pregnancy, but its utility in pregnancy is not clearly defined

Objective

To investigate changes in BNP during pregnancy in women with CHD and evaluate its utility as a predictor of adverse outcomes

Study Design

- Retrospective cohort study of singleton gestations with maternal CHD that delivered between March 2013 to August 2020
- BNP values collected and categorized as \leq or $>$ 100 pg/mL, median value, maximum value, and trend over time
- Primary outcomes:
 1. Composite adverse cardiovascular (CV) outcome
 2. Diagnosis of hypertensive disease of pregnancy
 3. Development of cardiac symptoms
- BNP values of those who did and did not develop primary outcome of interest compared with Chi-squared and Wilcoxon rank sum tests

Results

- 81 pregnancies with maternal CHD had at least one BNP measurement
 - 30 (37.0%) with composite adverse CV outcome
 - 16 (19.8%) developed HTN disease of pregnancy
 - 52 (64.2%) endorsed cardiac symptoms
- BNP was not different for those with composite adverse CV outcome ($p=0.76$) or endorsed cardiac symptoms ($p=0.40$)
- Hypertensive disease of pregnancy was associated with:
 - BNP $>$ 100 pg/mL ($p=0.01$)
 - Higher differences between minimum and maximum BNP values throughout pregnancy ($p=0.03$)
- Negative predictive value of BNP \leq 100 pg/mL for hypertensive disease of pregnancy = 96.1%

Conclusion

- In pregnancies complicated by maternal CHD, BNP $>$ 100 pg/ml and increasing BNP over gestation is associated with development of hypertensive disease of pregnancy
- Evaluation of BNP may be of clinical utility in the antepartum surveillance of pregnant women with cardiac disease, specifically when evaluating for hypertensive disease of pregnancy

Elevated BNP values are associated with hypertensive disease of pregnancy in pregnancies complicated by maternal cardiac disease



Questions?

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Table 1: BNP values for those with and without composite adverse cardiovascular outcome

Composite Adverse Cardiovascular Outcome			
	Yes n = 30	No n = 51	p-value
BNP > 100			
Yes	70% (21)	67% (34)	0.76
No	30% (9)	33% (17)	
% BNP > 100	33% (0, 67)	33% (0, 100)	0.84
BNP difference	59 (-18, 153)	36 (-17, 124)	0.70
Median BNP	76.8 (49, 134)	88.5 (55, 121)	0.67
Maximum BNP	138.5 (76, 323)	120 (66, 183)	0.20

Table 2: BNP values for those with and without development of hypertensive disease of pregnancy

Hypertensive Disease of Pregnancy			
	Yes n = 16	No n = 65	p-value
BNP > 100			
Yes	94% (15)	62% (40)	0.01
No	6% (1)	38% (25)	
% BNP > 100	35% (29, 83)	33% (0, 67)	0.17
BNP difference	98 (60, 185)	32 (-18, 112)	0.03
Median BNP	83 (69.8, 117.5)	81.5 (53, 134)	0.99
Maximum BNP	141 (122.5, 289)	118 (63, 199)	0.10

Table 3: BNP values for those with and without development of cardiovascular symptoms

Cardiovascular Symptoms			
	Yes n = 52	No n = 29	p-value
BNP > 100			
Yes	71% (37)	62% (18)	0.40
No	29% (15)	38% (11)	
% BNP > 100	33% (0, 57)	33% (0, 100)	0.69
BNP difference	44 (-20, 112)	55 (-5, 143)	0.21
Median BNP	76.8 (53.5, 120.5)	88.5 (53, 144)	0.52
Maximum BNP	135.5 (77.5, 237.5)	112 (60, 199)	0.37