

Sex Differences in Hemodynamic Responses following Acute Inflammation: Wave Separation Analysis

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ABSTRACT: Acute inflammation temporarily increases risk of cardiovascular events and alters hemodynamics. However, it is unknown whether acute inflammation differentially affects blood pressure and pulse wave characteristics, including forward or reflected pressure waves, in males versus females.

OBJECTIVES: The purpose of this study was to investigate the potential sex differences in the response to acute inflammation in blood pressure and pulse wave characteristics, measured with wave separation analysis

METHODS: 63 adults (29 males, 34 females) participated in the study. Participants received an influenza vaccine to induce acute inflammation. Central blood pressure and pulse waves were measured using tonometry and separated into forward and reflected waves, at baseline, 24hr post, and 48 hr post-vaccination. 2 x 3 repeated measure Analysis of Variance (ANOVA) was performed to investigate sex differences in acute inflammation.

RESULTS: (See table) There were significant sex differences in brachial SBP, brachial DBP, aortic DBP and aortic MAP with higher values in males. (p<0.05) However, there were no statistically significant sex differences in wave separation variables or aortic SBP during acute inflammation, but acute inflammation decrease brachial DBP, aortic SBP, and aortic MAP in all subjects combined, and reflected pulse pressure approached a decline in the entire cohort (p=0.06).

CONCLUSIONS: The results suggest that blood pressure, forward and reflected pulse wave pressure exhibited similar responses in males and females during acute inflammation.

	Brachial DBP(mmHg)†			Aortic DBP(mmHg)†			Aortic MAP(mmHg)†			Forward wave pressure(mmHg)			Reflected wave pressure(mmHg)		
	Baseline	24 hr Post	48 hr post	Baseline	24 hr Post	48 hr post	Baseline	24 hr Post	48 hr post	Baseline	24 hr Post	48 hr post	Baseline	24 hr Post	48 hr post
Male	69±9	67±9	69±9	70±9	68±9	69±9	87±10	84±9	85±10	29±5	29±5	28±6	19±7	17±7	18±6
Female	66±8*	63±7	64±7	66±8*	64±7	64±7	82±11*	79±8	79±9	27±5	27±5	26±5	17±7	15±5	15±4

* Different from other time point, p<0.05

† Sex difference. Significant at p<0.05