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### Effect of Menstrual Cycle Phase and Sex on Carotid Artery Pulsatility in Healthy Young Adults

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Carotid artery pulsatility is a measure of vascular resistance and is associated with aortic stiffness and cardiovascular disease risk. In healthy young adults, studies of carotid artery pulsatility have been limited to the early follicular (low hormone) phase of premenopausal women's menstrual cycles to avoid the potential confounding effects of naturally occurring hormonal fluctuations. Whether carotid artery pulsatility differs across a natural menstrual cycle in premenopausal women, and whether sex differences emerge during specific cycle phases, is largely unknown. **PURPOSE** To determine the influence of menstrual cycle phase and sex on common carotid artery (CCA) pulsatility index (PI) in young healthy adults. **METHODS** Fourteen premenopausal women with naturally occurring menstrual cycles ( $28 \pm 7$  yrs; cycle length,  $30 \pm 6$  days) and nine age-matched men ( $27 \pm 3$  yrs) participated in three repeated visits. Women were tested during the early follicular (Visit 1, cycle day  $4 \pm 2$ ), late follicular (Visit 2, cycle day  $13 \pm 3$ ), and mid-luteal phases (Visit 3, cycle day  $23 \pm 4$ ) and men's visits were time-matched to the women. Doppler ultrasound was used to measure CCA peak systolic blood velocity (SBV), minimum diastolic blood velocity (DBV) and mean blood velocity (MBV). PI was calculated as  $(SBV-DBV)/MBV$ . **RESULTS** CCA PI did not differ across menstrual cycle phases in women (Visit 1,  $1.4 \pm 0.2$ ; Visit 2,  $1.5 \pm 0.3$ ; Visit 3,  $1.5 \pm 0.3$ ) or across visits in men (Visit 1,  $1.7 \pm 0.3$ ; Visit 2,  $1.8 \pm 0.4$ ; Visit 3  $1.8 \pm 0.3$ ; interaction  $p > 0.05$ ), but it was significantly lower in women compared to men ( $1.4 \pm 0.3$  vs.  $1.8 \pm 0.3$ ; main effect of sex,  $p = 0.02$ ). There were no significant interactions or main effects of sex or visit on SBV, DBV, or MBV ( $p > 0.05$ ). **CONCLUSION** Controlling for the menstrual cycle may not be necessary when measuring CCA PI in young healthy premenopausal women. Moreover, differences in CCA PI between men and women appear to be independent of women's menstrual cycle phases.

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