

The relationship between sexual function and cardiovascular health in women: Preliminary results

Competition category: Social sciences, education and business

Department and school: Psychology; College of Arts and Sciences

Martin Seehuus, MA (Clinical Psychology PhD class of 2015); Alessandra Rellini, PhD
Sarah Hale, PhD; Martha Monson, MD; Ira Bernstein, MD

Introduction

Erectile dysfunction is a known predictor of cardiovascular disease (CVD) in men, and CVD is the leading cause of death in the United States in both men and women. Despite similarities in vascular engorgement during sexual arousal in men and women, little is known about CVD and female sexual arousal. While prior work has found that women with CVD report more sexual dysfunction, previous studies have not explored whether predictors of CVD are associated with sexual function in women. This is the first study to provide objective measures of the association between CVD and physiological measures to sexual arousal in women. Positive results would provide a useful tool for early detection of CVD risk in women.

Participants

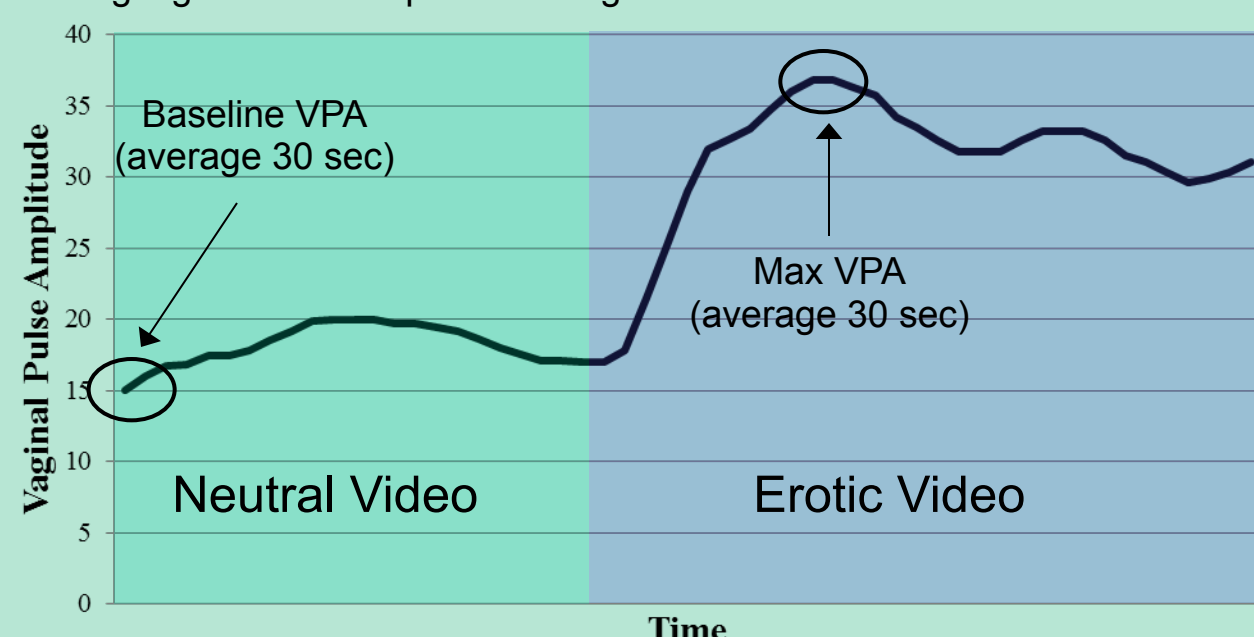
- N=6
- Premenopausal women between 25 and 45 years old
- Not on hormonal birth control
- Not on any regular medication
- Body Mass Index (BMI) less than 30
- Non-Smokers
- No sexual trauma history
- No pregnancy past five months in the past five years

Methods

Sexual psychophysiological measures

Vaginal Pulse Amplitude (VPA) is an indirect measure of blood flow in the vaginal walls

- Assessed with a Vaginal Photoplethysmograph, a clear plastic tampon-shaped device, placed and removed in private by the participant
- Participants place the device, then watch a neutral video, followed by an erotic video
- VPA baseline: average of VPA over a period of 30 sec during highest VPA response during neutral video
- VPA erotic: average of VPA over a period of 30 sec during highest VPA response during erotic video



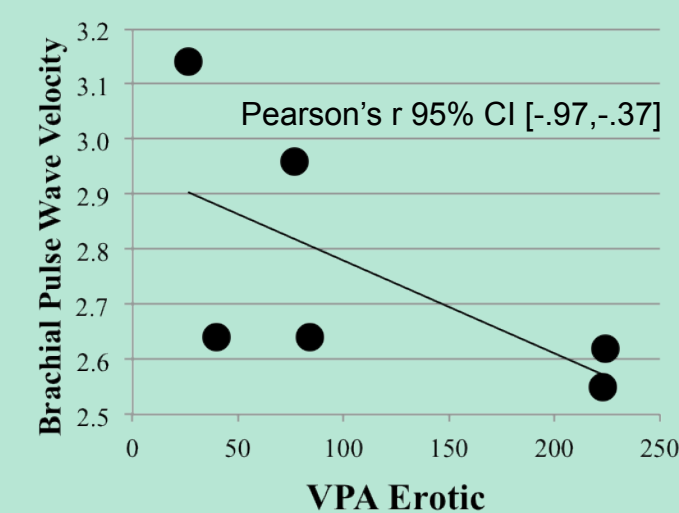
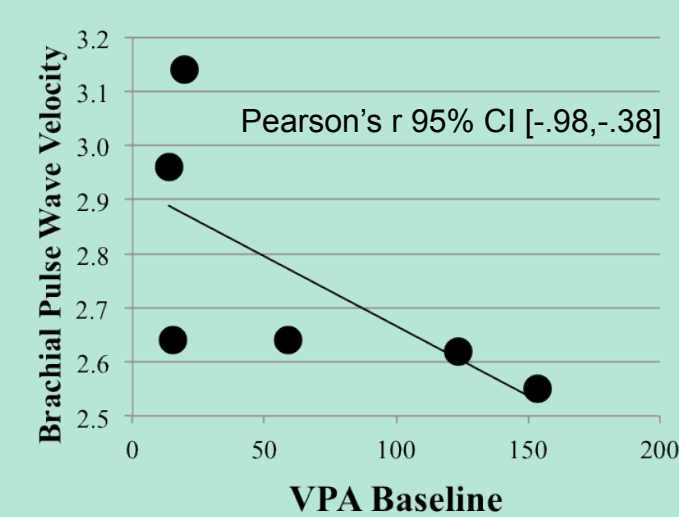
Cardiovascular Measures

- Doppler ultrasound measurements of cardiac volume and arterial size.
- Measurements were taken at the brachial (arm) and the popliteal (leg) arteries
- Flow-Mediated Dilatation
 - Assesses endothelial cell function
 - Artery is compressed and released, and the change in size of the artery is measured via ultrasound
 - Larger change means greater arterial flexibility and reduced cardiovascular risk
- Pulse wave velocity
 - Assesses arterial stiffness
 - Measures speed of the wave of blood caused by cardiac contraction (heartbeat)
 - Faster pulse wave velocity means less arterial flexibility and increased cardiovascular risk
- Cardiac output and stroke volume were assessed with echocardiography

Results

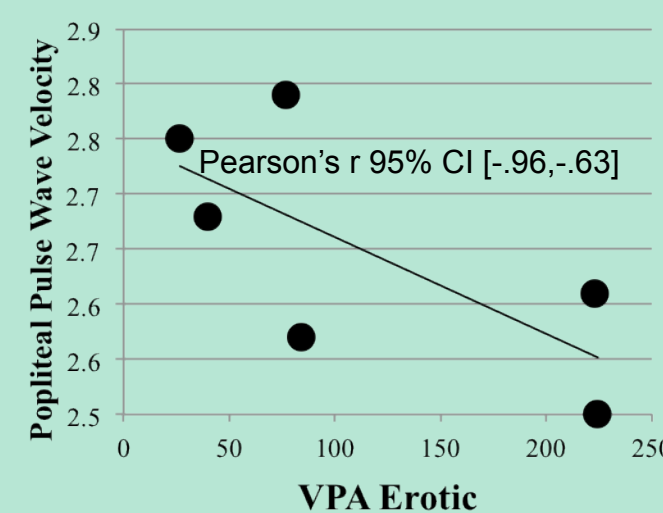
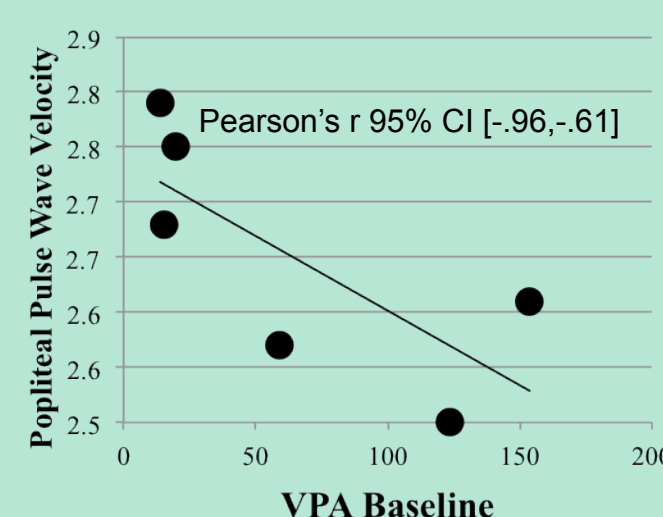
Pulse wave velocity seems to be related to vaginal pulse amplitude

Brachial Pulse Wave Velocity



- Higher levels of VPA (greater physiological sexual response) were associated with faster PWV (increased cardiovascular risk)
- The relationship was found in both the brachial and popliteal arteries, and with both the baseline and erotic VPA, suggesting the effect is *probably not random*
- This suggests that there *may be* a relationship between sexual function and risk of cardiovascular disease in women
- A relationship between flow mediated dilation and VPA was *not* found, suggesting that either the relationship is too weak to find given the present sample size, or that the relationship is not present
- This *may* suggest the mechanism of the relationship between sexual function is different for women than for men

Popliteal Pulse Wave Velocity



Discussion

- These preliminary results, although based on a small sample, are promising and suggest that there may be a connection between sexual function in women and risk for CVD. Data from additional 6 participants will be able to confirm these results.
- Future studies should examine clitoral blood flow as well as whether there are woman-detectable symptoms associated with cardiovascular risk.

Selected references

For a summary of research to date on cardiovascular disease and sexual function for women, see: Miner, M., Esposito, K., Guay, A., Montorsi, P., & Goldstein, I. (2012). Cardiometabolic Risk and Female Sexual Health: The Princeton III Summary (CME). *The Journal of Sexual Medicine*, 9(3), 641-651. doi:10.1111/j.1743-6109.2012.02649.x For a discussion of the use of pulse wave velocity as a predictor of cardiovascular disease, see: Wilkinson, I. B., Cockcroft, J. R., & Webb, D. J. (n.d.). Pulse wave analysis and arterial stiffness. *Journal of cardiovascular pharmacology. Supplement* (Vol. 32, pp. S33-S37). Presented at the Meeting of the International Scientific Faculty on Endothelial Function. For an explanation and discussion of the uses of vaginal photoplethysmography, see: Janssen, E. (2007). *The Psychophysiology of Sex*. Indiana University Press.; for another example, see: Meston, C., Rellini, A., & McCall, K. (2010). The sensitivity of continuous laboratory measures of physiological and subjective sexual arousal for diagnosing women with sexual arousal disorder. *Journal of Sexual Medicine*, 7(2pt2), 938-950. doi:10.1111/j.1743-6109.2009.01548.x



President E. Thomas Sullivan
Presidential Installation Ceremony
Student Scholars Poster Competition
University of Vermont, October 2012

Project Description

- Heart disease is the number one cause of death for women, and identifying predictors of future heart disease would enable early interventions.
- Erectile dysfunction is a strong predictor of cardiovascular disease in men but the relationship between sexual function and cardiovascular health in women is not as clear.
- This study is the first to explore sexual arousal responses as a predictor of cardiovascular disease in women.
- Although the study is still underway, preliminary findings are promising and suggest that impairments in physiological sexual arousal *may be* related to measures of cardiovascular health in women.
- Future research should explore how women can identify changes in their own sexual responses that may be predictive of heart disease