EFFECT OF PHOSPHODIESTERASE TYPE 5 (PDE-5) INHIBITION ON CORONARY MICROVASCULAR DYSFUNCTION IN WOMEN: AN ANCILLARY STUDY FROM THE NHLBI-SPONSORED WOMEN'S ISCHEMIA SYNDROME EVALUATION (WISE)

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Background: Microvascular dysfunction has been associated with angina-like chest pain and/or non-invasive test findings of ischemia in women without significant macrovascular coronary artery disease (m-CAD). Although there is no established treatment, we explored the effects of PDE-5 inhibition in women with this syndrome.

Methods: Coronary flow reserve (CFR) was determined using a Doppler flow wire and intracoronary adenosine in WISE. In a subgroup of 28 women (age 56±11 years, mean±SD) without m-CAD, PDE-5 inhibition (sildenafil 100 mg oral) was given after baseline CFR measurements. Repeat CFR measurements were made in identical fashion 45 minutes later.

Results: PDE-5 inhibition increased CFR from 2.7±0.6 to 2.9±0.6 (P=0.0031). This increase remained significant after controlling for age, menopausal status, hypertension, diabetes and systolic blood pressure-heart rate product. The relationship between log2 transformed CFR post-PDE-5 inhibition vs. pre-PDE-5 inhibition (see graph) demonstrated a slope and intercept each significantly different from the line of identity (0.58 vs. 1, P=0.0031; 0.69 vs. 0, P= 0.0119, respectively). This slope and intercept indicate that baseline CFR predicts a positive response to PDE-5; the lower the CFR, the greater the response.

Conclusions: PDE-5 inhibition may be useful for management of microvascular dysfunction in symptomatic women without significant m-CAD. A large randomized clinical trial with a long acting PDE-5 inhibitor seems appropriate. 

Regression Equation:

log2(CFR Post-PDE-5 Inhibition) = 0.58 ± 0.05 * log2(CFR Pre-PDE-5 Inhibition) + 0.69 ± 0.17