

Vascular deficits in Native American Women with Metabolic Syndrome during Dynamic Exercise

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ABSTRACT

Native Americans of the Southwest are predisposed to vascular diseases due to health disparate lifestyles influenced by diet, lack of exercise and decreased access to health care. These factors together may be responsible for the co-morbidities developed with Diabetes and Metabolic Syndrome (MetSyn) which are indicators of early onset cardiovascular disease. In a previous study, we evaluated Native Americans (NA) diagnosed with MetSyn or Type II Diabetes and compared the sedentary control NA and Caucasians (CA) during vascular measurements of FMD. We found that NA Control and MetSyn groups exhibited a decrease in vascular function during rate to peak and % dilation in the popliteal artery. Based on these previous findings we also evaluated the reactive vascular changes in the brachial and femoral arteries during dynamic handgrip (DHG) and single leg knee-kick (SLKK) to measure of the same groups in the previous study. **PURPOSE:** We hypothesize that the NA population with MetSyn will have lower vascular responses due to underlying vascular function restrictions compared to CA of the same groups and that similarly the sedentary control NA women would have blunted blood flow responses as seen in the FMD data. **METHODS:** 24 NA (Control=10, MetSyn=10) and 28 CA (Control=15, MetSyn=12) completed two visits. MetSyn women identified with 3 out of 5 criteria (high triglycerides, HDL<50, higher cholesterol, elevated blood pressure, high fasting glucose and waist circumference greater than 38 inches.) During the experimental visit, measurements BP, HR and vascular blood flow of the brachial and femoral arteries by Doppler ultrasound during DHG and SLKK. **RESULTS:** During DHG the CA Controls have no significantly difference conductance (ml/min/mmHg/100ml limb volume) compared the NA control or MetSyn groups. However, during SLKK the femoral artery conductance was significantly lower the CA MetSyn (0.0015 ± 0.001) compared to the CA control (0.0036 ± 0.0006) at the higher workload ($p=0.03$). The NA Controls and MetSyn were lower 0.0031 ± 0.0001 , and 0.0012 ± 0.0008) at the peak exercise however the findings were not significant. **CONCLUSION:** MetSyn NA and CA exhibited significant differences in vascular conductance in the limbs during dynamic exercise. In addition, normal healthy sedentary NA also had lower vascular conductance compared to the CA Control group indicating an ethnic difference.

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