EFFECTS OF NEBIVOLOL ON LEVELS OF MARKERS OF INFLAMMATION AND OBESITY IN RESPONSE TO EXERCISE-INDUCED STRESS: STUDIES IN OBESE AFRICAN-AMERICAN PATIENTS WITH STAGE I HYPERTENSION

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Monday, March 15, 2010, 9:30 a.m.-10:30 a.m.

Session Title: Clinical Trials and Interventional Therapies
Abstract Category: Risk Reduction and Rehabilitation
Presentation Number: 1127-89

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Background: There is a disproportionate burden of hypertension in African-Americans and less than 30% of African-Americans achieve blood pressure control with medications. Regulation of adipose tissue may represent an important link between increased insulin resistance, hypertension, and obesity, all key factors in the metabolic syndrome. Inflammation is involved in multiple stages of the development of atherosclerosis and serum levels of inflammatory markers including sVCAM-1 and sIL-6 may be used to predict cardiovascular disease risk. Nebivolol is a highly cardioselective vasodilatory beta1 receptor blocker that lowers blood pressure. We sought to determine whether nebivolol has beneficial effects on vascular markers of inflammation and oxidation in obese African-American patients with hypertension when exposed to exercise-induced stress.

Methods: 43 obese, African-American subjects with hypertension were treated with nebivolol (5-10 mg/day) for 8 weeks. Prior to treatment, the subjects underwent an exercise treadmill study to a level of 8 metabolic equivalents. Circulating levels of sIL-6, VCAM-1, adiponectin, and leptin were measured at pre-treadmill, and 1 minute, 30 minutes, 60 minutes, and 24 hours after treadmill. After the 8 week treatment period, exercise treadmill study and the measurement of markers were repeated.

Results: Treatment with nebivolol reduced levels of sVCAM-1 at pre-exercise by 21% and at 1 and 30 minutes by 12.5% and 20% respectively (p<0.005 from corresponding time point). In nebivolol treated patients there was a reduction in sIL-6 levels by 20% and pre-exercise and at 1 and 60 minutes by 19.7% and 33.5%, respectively (p<0.005 from corresponding time point). Treatment with nebivolol increased levels of serum adiponectin by 28% (p=0.012) and decreased levels of leptin by 32% (p<0.005 from pre-treatment).

Conclusions: Treatment with nebivolol improves markers of inflammation and obesity in a high-risk African-American population. Moreover, this effect is potentiated in response to exercise-induced stress. These results suggest that nebivolol differentially regulates markers of inflammation and obesity, thereby providing vascular protection.