

Racial Differences of eNOS Expression Respond to C-reactive Protein

Chenyi Ling, Jan Kretzschmar, Heather Grimm, Michael Brown.

Department of Kinesiology and Nutrition, University of Illinois at Chicago, Chicago, IL, USA

Background: African Americans (AA) have higher rates of cardiovascular diseases (CVD) compared to Caucasians (CA). Endothelial dysfunction is a common feature of CVD risk factors. Previous studies suggest racial differences in endothelial function exist at the physiological level. C-reactive protein (CRP), a risk marker for CVD, causes a reduction in eNOS expression and bioactivity in endothelial cells (ECs). AA individuals have significant higher concentrations of CRP than Caucasian (CA) individuals. The aim of this study was to investigate the racial differences of endothelial function under CRP stimulation at the cellular level.

Methods: Eight human umbilical vein endothelial cells (HUVECs) lines from African American (AA) and Caucasian (CA) donors with gender split evenly were cultured and incubated with CRP for 24-hrs. Doses of CRP were 0, 25, 50 and 100 µg/mL. Western blot was conducted to measure the expression of eNOS after CRP incubation. ImageJ densitometric analysis of eNOS bands expressed in relation to β-actin.

Results: As Figure 1 shows, at control condition, there was no difference in the eNOS protein expression between AA and CA HUVECs. The incubation of CRP significantly reduced the expression levels of eNOS on both AA and CA HUVECs in a dose-dependent manner. The reductions of eNOS protein expression in AA HUVECs at all three different concentrations were significantly greater than those in CA HUVECs.

Conclusion: AA HUVECs respond differently to CRP compared to CA HUVECs. CRP incubation causes greater reduction of eNOS expression on AA than CA HUVECs. The results suggest a possible mechanism for the racial differences in endothelial dysfunction.

