ARIC Manuscript Proposal # 1225

1.a. Full Title: Race-gender differences in the relationship of exhaustion to CHD: The ARIC Study

b. Abbreviated Title (Length 26 characters): race-gender differences in exhaustion-CHD

2. Writing Group (list individual with lead responsibility first):

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3. Timeline: Begin analyses: March 2007
   First draft of manuscript to ARIC Publications Committee: December 2007
   Abstract presentation at AHA Council on Epidemiology and Prevention:
     Spring 2008
   Submit to Journal: Summer 2008

4. Rationale:

   Exhaustion, as measured in ARIC, is defined as excessive fatigue, feelings of demoralization, and increased irritability, and is often considered to be a form of adaptation to prolonged stress (1). A recent ARIC analysis reported significantly higher mean exhaustion scores in women than in men and higher scores in black than in white participants (2). These findings suggest that there may be important race-gender differences in the prevalence of exhaustion, and that scores among black women may be the highest. Prior studies have reported higher exhaustion scores in women than in men (3, 4), but neither racial/ethnic nor race-gender differences have been described in a large, epidemiologic study. Furthermore, there have been no epidemiologic studies of race-gender differences in the association of exhaustion to coronary heart disease (CHD) (e.g., prevalent CHD or incident CHD).

   Exhaustion and CHD in black women may exist as co-morbid conditions. Also, exhaustion may be a strong precursor of incident CHD in black women. The likelihood of co-morbidity may be greater in black women than in black men, and white men and women. The basis for these hypothesis is the high prevalence of CHD morbidity in black women (5); previous findings of a positive association between exhaustion and incident CHD (1,2 ) and between exhaustion and CHD risk factors (6,7); and black women’s unique vulnerability to psychosocial distress and consequent physiological “wear and tear”(8, 9). Exhaustion is commonly reported in the prodromal period of an acute myocardial infarction among women. In a recent study, a
preponderance of women (70.7%) reported unusual fatigue as compared with a much smaller proportion (29.7%) who reported typical angina symptoms in the prodromal period of MI (10).

It has been hypothesized that black women are particularly vulnerable to adverse psychological states and adverse health outcomes, due at least in part, to the cumulative toll exacted by their dual minority status as black and as woman, commonly referred to as “double jeopardy” (11). In a recent study, black women reported higher levels of composite psychosocial distress (as defined by stressful life events, ongoing stressors, unfair treatment, and economic hardship) than their white counterparts (9). In that investigation, increased psychosocial distress was associated with greater levels of subclinical carotid atherosclerosis in black women, but not in white women. Similar results have been reported in a recent study of race-gender differences in allostatic load (defined as the cumulative physiologic toll exacted on the body due to attempts to cope with unrelenting psychosocial stress) (8). The investigators reported that mean allostatic load scores were highest among black women at all age strata. Black women from low income families and black women not from low income families had the highest and second highest relative odds of having high allostatic load scores, respectively. In addition, black women had the highest excess allostatic load scores compared with their male and white counterparts.

The purpose of the proposed analyses is to examine race-gender differences in the relationship of exhaustion to both prevalent CHD and incident CHD. Two companion papers are being proposed: 1) race-gender differences in the relationship of exhaustion to prevalent CHD (cross-sectional analyses); and 2) race-gender differences in the relationship of exhaustion to incident CHD (prospective analyses).

5. **Main Hypothesis/Study Questions:**

**H1:** Mean exhaustion scores will be higher among black women compared to black men, white men, and white women.

**H2:** Exhaustion will be positively and more strongly associated with prevalent CHD among black women compared to black men, white men, and white women.

**H3:** Exhaustion will be positively and more strongly associated with incident CHD among black women compared to black men, white men, and white women.

**Statistical Analyses:**

**Descriptive:** Means and percentages will be used to describe the population CHD risk factors by level of exhaustion. Statistical significance will be determined a chi-square test of association or one-way analysis of variance.

**Inferential:**

**H1:** A one-way analysis of variance will be used to test differences in mean exhaustion scores among race-gender subgroups.

**H2:** Heterogeneity of the exhaustion-prevalent CHD association by race-gender will be assessed. If the interaction term is significant, then the remaining analyses will be stratified by race-gender and logistic regression analysis will be conducted to determine the relative odds of having prevalent CHD in each of the race-gender subgroups. Each model will be adjusted for age, LDL- and HDL-cholesterol, hypertension, diabetes, waist-to-hip ratio, history of smoking, years of cigarette smoking, and educational level.
Inferential: prospective
H3: Heterogeneity of the exhaustion-incident CHD association by race-gender will be assessed. If the test of interaction by race-gender is significant, then the remaining analyses will be stratified by race-gender and Cox proportional hazards regression analysis will be used to assess the relative hazard of incident CHD in each of the race-gender subgroups. The Kaplan-Meier product limit method will be used to estimate cumulative probabilities of incident CHD over time for each race-gender subgroup. Each model will be adjusted for age, LDL- and HDL-cholesterol, hypertension, diabetes, waist-to-hip ratio, history of smoking, years of cigarette smoking, and educational level.

6. Data (variables, time window, source, inclusions/exclusions):
Variables: vital exhaustion scores at Visit 2, LDL- and HDL- cholesterol, hypertension, diabetes, waist-to-hip ratio, history of smoking, years of cigarettes smoking, diabetes mellitus, educational level, age, race/ethnicity, gender, center, prevalent CHD at Visit 2, incident CHD events through 2003

7.a. Will the data be used for non-CVD analysis in this manuscript?  
   ___ Yes  ___X___ No

   b. If Yes, is the author aware that the file ICTDER02 must be used to exclude persons with a value RES_OTH = “CVD Research” for non-DNA analysis, and for DNA analysis RES_DNA = “CVD Research” would be used?  
      ___ Yes  ___X___ No
      (This file ICTDER02 has been distributed to ARIC PIs, and contains the responses to consent updates related to stored sample use for research.)

8.a. Will the DNA data be used in this manuscript?  
   ___ Yes  ___X___ No

8.b. If yes, is the author aware that either DNA data distributed by the Coordinating Center must be used, or the file ICTDER02 must be used to exclude those with value RES_DNA = “No use/storage DNA”?  
   ___ Yes  ___X___ No

9. The lead author of this manuscript proposal has reviewed the list of existing ARIC Study manuscript proposals and has found no overlap between this proposal and previously approved manuscript proposals either published or still in active status. ARIC Investigators have access to the publications lists under the Study Members Area of the web site at: http://www.csec.unc.edu/ARIC/search.php
   ___X___ Yes  _______ No

10. What are the most related manuscript proposals in ARIC (authors are encouraged to contact lead authors of these proposals for comments on the new proposal or collaboration)?

   Williams JE, Kop WJ, Couper DJ, Welch VL, Mosley TH, Rosamond WD. Convergence of anger and exhaustion as risk factors for adverse cardiac events: The Atherosclerosis Risk in Communities (ARIC) study. ARIC MS #640 (Under review).
11. Manuscript preparation is expected to be completed in one to three years. If a manuscript is not submitted for ARIC review at the end of the 3-years from the date of the approval, the manuscript proposal will expire.

References:


