ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #284

1. Title:
Carotid arterial distensibility related to family history of coronary heart disease and of hypertension in the ARIC study

2. Writing Group:
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3. Timeline:
The work will be started when the dataset is available.

4. Rationale:
Decreased compliance of peripheral arteries may indicate preclinical atherosclerosis. There are theoretical reasons to expect that family history of coronary heart disease (CHD) and hypertension (HPT) would be associated with decreased compliance of peripheral arteries, because of family aggregation of CHD and HPT, and family aggregation of major risk factors of atherosclerosis. In the Bogalusa Heart study, family history of CHD was associated with carotid artery indices (Ep) of compliance in children ages 10-17. However there is no study reported on similar findings in adults. Therefore, we propose to examine the relation between family history of CHD and HPT, and a measure of carotid artery compliance (lumen diameter change controlled for blood pressure) in men and women, African-American and whites. Because of its historic importance in terms of the Bogalusa Heart Study, we will also examine relationships between Ep, a frequently used index of distensibility, and the family history variables. If an association is found, we shall determine how much is attributable to covariance with variables such as lipids, diabetes, glucose, insulin, BMI, smoking, alcohol consumption, fibrinogen, each of which may be related to both arterial compliance and family history of CHD or HPT.

5. Main Hypotheses:
1. Is a quantitative index of family history (risk score) of coronary heart disease associated with the proband's carotid artery distensibility?
2. Is family history of hypertension in parents associated with the proband's carotid artery distensibility?
3. Do these associations vary with different age, race, gender and the proband's presence or absence of coronary heart disease or hypertension?
4. Do these relationships remain after control for covariant risk factors?

6. Plan of Analysis:
A quantitative family risk score of CHD will be calculated. History of hypertension in parents will be treated as an ordinal variable with values of 0, 1, or 2. Carotid artery distensibility will be indicated by carotid artery lumen change adjusted for blood pressure and by Ep (for historic comparisons). Descriptive analysis will be used to summarize the participant's characteristics. Multivariate regression analysis will be employed to assess the association of carotid stiffness with family history score of CHD and parental history of hypertension, first adjusting only for age and then successively for the possible intervening risk factors. Results obtained for Ep and carotid diameter change, used in the analyses will be compared.

7. Data requested:
This analyses will primarily use Visit 2 data, and will be restricted to participants who completed the Visit 2 exam. For these individuals with missing distensibility or risk factor data at Visit 2, the visit 1 record will be used if this provides complete data for that individual.