ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #089 REVISED

1. Title:
Analysis of Plasma Lipids, Lipoproteins, and Apolipoproteins during Visits 1 and 2 in the Atherosclerosis Risk in Communities (ARIC) Study

2. Writing Group:
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3. Timeline:
All ARIC Visit 1 data are currently available for analysis at Baylor College of Medicine. Analysis will begin immediately using Visit 2 data of the available approximately 10000 participants.

4. Rationale:
It is of great interest to examine if there are changes over time in the blood risk factors known to be associated with atherosclerosis in the participants of the four populations monitored in the ARIC Study. Effects of the National Cholesterol Education Program may be evident since 1987. Preliminary evidence suggest that ARIC participants are more aware of their cholesterol levels at Visit 2 than Visit 1.

Plasma lipids, lipoproteins, and apolipoproteins levels have been measured in 15000 ARIC participants in the three years of Visit 1. These participants are currently being reexamined three years later in Visit 2. This sampling strategy allows for the examination of changes in parameters of the lipid transport system in individuals between visits. Trends over time in these measurements may be identified. In addition, the change of ranking of participants between visits according to the guidelines of the National Cholesterol Education Program will be addressed.

The extensive data collection used in the ARIC Study offers the opportunity not only to study these data for trends and changes in these analytes but also to investigate for possible causative factors that are associated with these data changes or trends.

5. Main Hypothesis/Issues to be Addressed:
The purpose of this manuscript is to analyze the lipid data acquired during Visit 1 and Visit 2. The lipid data from each visit will be examined to determine if time trends exist within each visit time period as well as within the entire time period of both visits. Overall mean changes in these analytes between visits will be determined and these changes will be assessed with specificity to field centers, race, and sex. Laboratory quality control data will be used to correct population trends for laboratory trends.

The association of probable causative factors with the time trends or changes in these analyte levels with either Visit 1 or Visit 2 or between Visits 1 and 2 will be examined. These will include diet, BMI, body

weight, waist to hip ratio, and physical activity. Trends will be examined separately in the four communities and in higher and lower educational or income groups.

The National Cholesterol Education Program has defined levels of risk based on total cholesterol and LDL-cholesterol levels. The proportion of participants ranked according to their risk level will be analyzed at each visit and the change in ranking will be reported. The number of individuals with low HDL-cholesterol (at and below 35 mg/dL for males and at or below 45 mg/dL for females) in each visit will also be analyzed.

6. Data Requirements:
This manuscript will require the measurements of total cholesterol, triglyceride, HD-chol, HDL(3)-chol, HDL (2)-chol, LDL-chol, apoA-I, apoB, Lp[a] from those subjects sampled in Visit 1 and 2. The whole population will be examined with subsequent analyses using exclusion criteria including change of medication or hormone use, heart or arterial surgery, TIA, or stroke, non-fasting, and other appropriate variables. These estimates will include examining gender, age, field center, race, diet, BMI, body weight, waist to hip ratio, level of income and education level differences, physical activity, medical history and other environmental variables.

7. Data Analyses:
Included is a more detailed list of proposed initial analyses.

A. Generate distributional characteristics of plasma lipids, lipoproteins, and apolipoproteins by sex, age [5 year increments], and race for each Visit. Logarithmic transformations of total triglyceride and Lp[a]. Mean, standard deviations, and percentiles will be generated and compared for each Visit.

B. The lipid data will be analyzed to determine if trends are present in any of the analytes within the duration of each visit and then over the entire time period of both visits. Internal quality control data will be analyzed to determine if any trend is influenced by long term laboratory drift. If sudden shifts or trends exist, then the association of probably causative factors will be examined. These will include diet, medications, BMI, body weight, waist to hip ratio, physical activity and other environmental factors.

C. The overall mean changes and field center, race, sex-specific changes in lipid analyte levels between the two visits will be examined. If significant changes are found in these comparisons then the association of other parameters, such as change in medicine or hormone use, BMI, body weight, waist to hip ratio, and income and other factors will be analyzed. In addition, stratification by education status is potentially important.

D. The issue of total cholesterol and LDL-cholesterol ranking according to the National Cholesterol Education Program will be analyzed in both visits. Also the number or participants in each visit at and below 35 mg/dL for HDL-cholesterol for males and at or below 45 mg/dL for females will be be compared.