ARIC Manuscript Proposal # 961

PC Reviewed: 09/10/03  Status: A  Priority: 2
SC Reviewed: 09/11/03  Status: A  Priority: 2

1.a. Full Title:
Natural History of the Metabolic Syndrome as defined by the National Cholesterol Education Program, Third Adult Treatment Panel Report (NCEP ATP III)

b. Abbreviated Title (Length 26 characters):
Nat. History Met. Syndrome

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

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Writing group members: Wayne Rosamond, Diane Catellier, Cynthia Girman, and Angela Liese, Gerardo Heiss

3. Timeline: Analyses will use currently available ARIC cohort data files from the four visits and will begin immediately following approval of the proposed manuscript.

4. Rationale: The metabolic syndrome, also known as the insulin resistance syndrome, is the co-occurrence of several conditions, including impaired glucose and insulin metabolism, dyslipidemia, elevated blood pressure, impaired fibrinolysis, and endothelial dysfunction that is often accompanied by central adiposity. The underlying precursors of the metabolic syndrome are not completely understood but the body’s resistance to insulin mediated glucose disposal as well as accumulations in visceral adiposity and defects in fatty acid metabolism are likely causal determinants. Although the etiologic origins of the syndrome, as well as the question of which specific traits should be considered endemic to the syndrome, continues to be a source of research and debate, there is considerable evidence that individuals with the metabolic syndrome are at increased risk of developing cardiovascular disease and diabetes.

Until recently, criteria to define the metabolic syndrome in epidemiologic studies have varied, sometimes considerably. In 2001, the National Cholesterol Education Program (NCEP), Third Adult Treatment Panel Report (ATP III) proposed a definition of the metabolic syndrome as a tool to aid in the clinical evaluation of individuals at risk for coronary heart disease. Recent analyses based on the Third National Health and Nutrition Examination Survey (NHANES-III), a nationally representative sample of U.S. adults, have estimated that the
metabolic syndrome as defined by ATP III is present in approximately one quarter of adults, increases steadily with age, and is strongly associated with physical inactivity and obesity (BMI ≥30). However, due to the cross-sectional nature of the NHANES data, these findings are limited to a single point in time.

In fact, few studies have reported on the natural history of the metabolic syndrome and these reports have been limited to investigator-initiated definitions. To our knowledge, no study of the natural history and longitudinal trends in the classification of the syndrome using the ATP III metabolic syndrome definition has been published. Such information would increase our understanding of the progression and relative stability of the metabolic syndrome within individuals over time and provide insight into the relative stability of its individual component traits using a standard, consensus-based definition of the syndrome.

The Atherosclerosis Risk in Communities (ARIC) Study provides an opportunity to learn more about the natural history and epidemiology of this syndrome by examining longitudinal trends in the prevalence of the ATP III defined-metabolic syndrome among individuals over a period of nine years of follow-up in a large and ethnically diverse cohort of middle-aged adults.

5. Main Hypothesis/Study Questions:

- What are the longitudinal patterns of the classification of the metabolic syndrome within individuals over time?
- How stable is the metabolic syndrome within individuals over time compared to the individual components that define it (i.e., elevated blood pressure, low HDL cholesterol, high triglycerides, large waist, and impaired fasting insulin)?
- Are the patterns of classification similar across demographic characteristics of interest (e.g., gender, race/ethnicity, age)

Longitudinal analyses will be performed using individuals’ data from each ARIC visit. In addition, mixed-effects modeling will be used to assess the degree to which the observed patterns of the metabolic syndrome classification over time may have been influenced by regression to the mean. Empirical Bayes estimates will be produced for the individual components of the metabolic syndrome that correct for serial correlation of repeated measures within individuals over time.

6. Data (variables, time window, source, inclusions/exclusions):

The study population will include individuals with complete data on each component of the metabolic syndrome at the baseline and each of three follow-up visits (9,381). Individuals with the following conditions will be excluded:

- Bloodwork obtained after < 8 hours fasting
- African-American participants not residing in Forsyth or Jacksonville centers
- Race other than African American or White
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? NA ____ Yes  ____ 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”? NA ____ Yes  ____ 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://bios.unc.edu/units/csrc/ARIC/stdy/studymem.html
   ____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)?
    Proposal # 831 – Same lead author as the current proposal. Several co-authors have been invited to participate in the writing group.

    Proposal # 274 – Lead author, Dr. Angela Liese has been contacted and has agreed to participate in the new proposal.

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.

    I understand and agree with this requirement.
References


