ARIC Manuscript Proposal # 949

PC Reviewed: 07/01/03   Status: __A__   Priority: __2__
SC Reviewed: 07/18/03   Status: __A__   Priority: __2__

1.a. Full Title: Smoking History and Preclinical Change in Echocardiographic Defined Cardiac Structure and Function: The ARIC Study

b. Abbreviated Title (Length 26 characters): Smoking and Cardiac Structure, Function

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

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Timeline:

Complete analysis Sep, 2003
Submit first draft to publications committee May, 2004
Submit to Journal Dec, 2004

3. Rationale:

Cigarette smoking is widely accepted as a major risk factor for the development of clinical cardiovascular diseases. The effect of cigarette smoking on cardiac burden can be immediate and long term. Both basic science and clinical science studies have demonstrated that heart rate, blood pressure, and blood viscosity change dramatically immediately after smoking a cigarette. Long term effects of smoking on cardiac events have also been investigated in many studies. Study from NHANES data has found that cigarette smoking is a risk factor for congestive heart failure. ARIC has demonstrated that cigarette smoking is associated to progression of atherosclerosis.

However, the relationship of pre-clinical change in cardiac structure and function to smoking is not well documented yet. The echocardiographic component of ARIC study provides an opportunity to study the potential relationship between smoking and echo-defined structure and function. Of special interest is the difference between smokers and never smokers in left ventricular mass and geometry, left ventricular systolic and diastolic function, as well as indirect measurements of arterial function.
5. **Main Hypothesis/Study Questions:**

1) Is higher left ventricular mass index and higher prevalence of left ventricular hypertrophy associated with smoking history?

2) Are abnormalities in cardiac functions (e.g. ejection fraction, ejection shortening, stroke volume) associated with smoking history?

3) What is the impact of heavy smoking, indicated by longer years of smoking and higher usual daily rate (usual number of cigarettes per day), on the cardiac structure and function compared to light smoking?

4) What is the impact/additive effect of environmental tobacco smoke (ETS) exposure, so called “passive smoking”, on the cardiac structural and functional change?

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

   **Study population:** Only people who have undergone echocardiographic exam will be included in this study. There are approximately 2400 participants for this study, who are all African Americans of the Jackson site of the ARIC cohort.

   **Smoking Variables:** Baseline smoking history and amount will be used as predictors. Smoking status will be defined as current smokers, past smokers, never-smokers. For smokers, smoking amount is defined as (a) years of smoking and (b) usual daily rate (usual number of cigarettes per day), since they are considered more sensitive indicators than “pack-years”. Possibly, secondary analysis will be performed based on the exposure to environmental tobacco smoke (ETS). Both smokers and never-smokers will be investigated on this issue and further be defined as exposure to environmental tobacco smoke, and no exposures. (The additive effect for ETS in smokers has been raised by recent publications).

   **Echocardiographic variables:** Cardiac structural measurements including LV mass, left ventricular hypertrophy, left ventricular geometry. Cardiac function indicators include LV volumes, stroke volume, end-systolic stress, midwall fractional shortening, estimate of central arterial stiffness (pulse pressure/stroke index), ejection fraction, ejection shortening.

   **Demographic variables:** age, gender, race.

   **Other variables of interest:** Fibrinogen, VWF, platelet count, blood viscosity, SBP and heart rate, diabetics, body mass index, serum LDL, serum HDL, peripheral vascular function, physical activity, etc.

   **Exclusion criteria:** Missing data on relevant echocardiograph measurements.

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://bios.unc.edu/units/cscc/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)?

   MS # 369 Cigarette smoking and MRI abnormalities
   MS # 539B Smoking as a predictor of incident diabetes mellitus
   MS #067 Cigarette smoking and carotid atherosclerosis

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


