ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #575

l. Full Title: Ankle-Brachial Index and Ischemic Stroke Incidence: The ARIC Study
   Abbreviated Title (length 26): ABI and Stroke Incidence

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

Lead: Albert Tsai
Address: 1300 S. Second Street, Suite 300
         Minneapolis, MN 55454
Phone: (612) 626-8884
Fax: (612) 624-0315
Email: tsai@epivax.epi.umn.edu

Aaron Folsom
Al Tyroler
Wayne Rosamond

3. Timeline:
4/98-6/98: Analysis
Summer, 98: draft
Fall, 98: Submit 1st draft for editing by co-authors

4. Rationale:
Ankle-brachial Index (ABI) is the ratio of tibial artery systolic blood pressure (SBP) to brachial artery SBP. It has long been known to be a marker for lower limb peripheral artery disease, which, in turn, is often associated with general cardiovascular disease. ABI has also been shown to be negatively associated with cardiovascular disease events. In a previous cross-sectional ARIC report, ABI was previously reported to be inversely associated with clinical coronary heart disease (CHD), stroke and generalized atherosclerosis. It was also inversely associated with CHD incidence. The ability of ABI to predict incident stroke, however, is not firmly established. In the Edinburgh Artery Study, relative risk for stroke for those with an ABI of s 0.9 was 1.98 (95% CI 1.05-3.77) after adjusting for age, sex, angina, MI, and diabetes in a population of 1592 white men and women aged 55-74. Relative risk for stroke death was not statistically significant in this group. No other study to our knowledge has studied ABI and incident stroke. ABI is a non-invasive procedure, which may be useful in clinical practice for screening individuals with other cardiovascular risk factors for risk of stroke. This study will address the question of the ability of AB1 to predict stroke in the ARIC population.

5. Main Hypothesis:
1) Does ABI predict ischemic stroke incident in ARIC?

2) Is this measurement an independent predictor of stroke beyond other risk factors?
3) Is the association linear across ABI range, or is there a threshold?
4) Does the predictive ability of ABI for stroke vary by gender and race groups?

6. Data (variables, time window, source, inclusions /exclusions):
Dependent variable: ischemic stroke through 1995.
Independent variable: ABI, categorical and continuous.
Univariate statistics (means & proportion) for potential covariates by ABI strata, overall and by gender groups, will be calculated. Cox proportional hazards models will be used to predict hazard rate ratios of stroke, adjusting for age, race, and center. Additional models will be run in order to see if ABI predicts stroke beyond other risk factors. These other risk factors will be considered as potential covariates: lipids, cigarette smoking, physical activity score, diabetes, left ventricular mass (defined by ECG), hypertension, waist-to-hip ratio, and hemostatic factors.

The nature of the association across ABI range (e.g., linear, curvalinear, etc.) will be tested by examining relative risks in dummy-coded categories of ABI.

Exclusions will be made on prevalent stroke and missing ABI values. If numbers permit, analyses will be done on gender-specific and race-specific.