ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #339

1. Title: Arteriolar narrowing and BP

2. Writing Group:

Sharrett AR, Hubbard LD, Cooper LS, Sorlie PD, Brothers RJ, Nieto J, Klein R

3. Timeline:

Analyses to begin on first 8000 exams; publication to follow completion of retinal quantitative readings.

4. Rationale:

Changes in retinal arterioles may reflect the degree of damage in the retina and elsewhere due to elevated BP, which in turn may influence the occurrence of cardiovascular complications. Retinal vascular signs of longstanding hypertension are infrequently observed in populations with access to antihypertensive therapy. Generalized arteriolar narrowing, believed to be the earliest retinal sign of hypertension, has previously been assessed imprecisely. Newer studies have developed a technique (based on that of Parr) which summarizes the diameter of all major retinal arterioles as a central retinal arteriolar equivalent, which is scaled against a similarly estimated central retinal venous equivalent. The arterial/venous equivalent ratio, indicative of narrowing, is strongly associated with elevated BP. Prior to examining hypotheses related to clinical cardiovascular diseases, one must understand the precise relationship between BP and retinal arteriolar narrowing.

5. Hypotheses:

The main hypotheses are that retinal arteriolar narrowing is related to current BP levels, and that associations with long-term BP persist independently of current BP, short-term BP variation (in the Intraindividual Variability Study) and antihypertensive medication use. To test these hypotheses, it will be necessary first to test whether elevated BP causes a generalized arteriolar narrowing or greater narrowing more peripherally in the retinal field (affecting branch/trunk diameter ratios). These associations may weaken at older ages and be different among diabetics. Assocations may differ for systolic and diastolic BP.

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

All exam 1 through exam 3 sitting, standing, and supine BP. IIV study BP and retinal data. Quantitative and qualitative retinal data. Covariates (age, sex, race, community, exam dates, exam 1-3 medication use, medical history). Exclude persons with inadequate retinal photographic quality, and, for some analyses, diabetics.

Analysis to be performed in Bethesda. An exemption from Coordinating Center official analysis is requested. Statistical analysis plan to follow.