ARIC MANUSCRIPT PROPOSAL FORM

Manuscript #406

1.a. Title: Serum magnesium concentration and the risk of incident non-insulin dependent diabetes mellitus (NIDDM)

  b. Abbreviated title: magnesium and diabetes

2. Writing Group: *Kao (lead) Brancati, Nieto, Folsom, Watson (and others to be named)
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3. Timeline: Begin now, complete by March 1997

4. Rationale:
Prior studies have shown associations between magnesium deficiency and insulin resistance, carbohydrate intolerance, hypertension, cardiovascular disease, and diabetes. These studies include: (1) animal studies which demonstrate that magnesium supplementation reduces the development of diabetes in Zucker diabetic rats; (2) retrospective data that suggest magnesium deficiency is a risk factor for the development of diabetic complications; and (3) cross-sectional data which show that serum magnesium levels and dietary magnesium intake are significantly lower in subjects with prevalent CVD. Hypertension and diabetes than in those without the disease. Prospective studies are required to establish whether low serum magnesium predicts the development of incident NIDDM in human populations. The identification of low serum magnesium as a predictor of NIDDM could have important implications for public health strategies aimed at primary prevention.

5. Hypothesis:
Low serum magnesium concentration predicts the development of non insulin-dependent diabetes mellitus.

6. Design:
Six-year prospective cohort study of ARIC participants who were non diabetic at baseline.

7. Data: Exposure
          Outcome Serum magnesium concentration at Visits 1 & 2
                    Incident NIDDM after Visit 1
                    1. Fasting blood glucose > 140mg/dL or
                    2. Uses insulin or oral hypoglyemic agents or
                    3. Reports physician diagnosed diabetes age, race, gender, education, physical activity indices, dietary
          Covariates   energy intake, parental history of diabetes, smoking, body-mass-index, diuretic use, anthropometric
                    measures, fasting insulin, calcium, albumin, potassium, creatinine
          Analysis: Time-to-event and/or person-years approach

8. Power:
With a Type I error of 0.05 (two-tailed), the study will have 90% power to detect relative risk of 1.5 between

the highest and the lowest quartile of serum magnesium concentration.