

ARIC MANUSCRIPT PROPOSAL #687

PC Reviewed: 08/12/99
SC Reviewed: _____

Status: Approved
Status: _____

Priority: 1
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1.a. Full Title

Relationship of periodontal disease to coronary heart disease and intimal-medial arterial wall thickness. The ARIC study.

b. Abbreviated Title

Gum disease, CHD, and IMT

2. Writing Group

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3. Time Line

Obtain data set:	August 1999
Begin statistical analysis:	August 1999
Complete statistical analysis:	Fall 1999
Complete manuscript:	Winter 1999/2000

4. Rationale:

While factors such as smoking, hypercholesterolemia, obesity, hypertension, and diabetes are well-established risk factors for coronary heart disease, results from case-control

studies (Mattila *et al.*, 1989; Mattila *et al.*, 1993; Arbes *et al.*, 1999) and longitudinal studies (DeStefano *et al.*, 1993; Mattila *et al.*, 1995; Beck *et al.*, 1996; Joshipura *et al.*, 1996) suggest that periodontal disease may also be associated with coronary heart disease. Although these studies evaluated different populations and used different measures of periodontal disease, their results were remarkably consistent, and the longitudinal studies demonstrated that periodontal disease preceded the coronary outcomes (Beck *et al.*, 1998). Recently, there has been a renewed interest in the role of infection in the pathogenesis of cardiovascular disease (Nieminen *et al.*, 1993; Mattila *et al.*, 1998; Mehta *et al.*, 1998; Nieto, 1998). It has been hypothesized that the chronic inflammatory burden of periodontal disease and the host response to this inflammation may be involved in development of cardiovascular disease, in particular atherosclerosis (Beck *et al.*, 1996). It has also been hypothesized that periodontal pathogens may disseminate systemically through the blood stream and infect the vascular endothelium directly, leading to atherosclerosis and myocardial ischemia and infarction (Herzberg and Meyer, 1998).

Most previous findings are from secondary analyses of data from studies not designed to investigate this relationship. More studies are needed to confirm past findings and to shed new light on the association. The purpose of this study is to confirm cross-sectional reports of an association between periodontal disease and coronary heart disease and to extend previous findings to the relationship between periodontal disease and atherosclerosis, and association that previously has not be investigated. Intimal-medial arterial wall thickness will be used as a measure of atherosclerosis.

5. **Main Hypothesis:**

Individuals with prevalent periodontal disease are more likely to have prevalent coronary heart disease, incident coronary heart disease, and increased intimal-medial arterial wall thickening than individuals without periodontal disease.

6. **Data:**

Outcome variables. The three outcome variables are prevalent coronary heart disease, incident coronary heart disease, and intimal-medial arterial wall thickness

Main independent variable. The main independent variable is prevalent periodontal disease as measured by gingival bleeding, probing pocket depth, and periodontal attachment loss.

Covariables. The covariables will be age, sex, race, education, body mass index, hypertension, smoking, diabetes, fasting time, serum cholesterol, HDL cholesterol, LDL cholesterol, and triglycerides.

Time window. This study will be a cross-sectional study of the data obtained from ARIC cohort members at Visit 4. Incident CHD will be determined from baseline to Visit 4.

Inclusions/exclusions. This study will include all ARIC cohort members for whom periodontal disease, coronary heart disease was assessed at Visit 4 and for whom intimal-medial thickness was assessed at Visits 3 or 4. Approximately 7000 persons had periodontal examinations at Visit 4.

References:

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