Total Dietary Fiber, and Selected Vegetable, Fruit, Legume and Cereal Fiber Intake and Risk of Heart Attack in Periodontitis Subjects

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Abstract:
Background: Epidemiological studies have found an association between periodontal disease and coronary artery disease (Arbes, Slade et al. 1999; Beck, Elter et al. 2001; Genco, Offenbacher et al. 2002), and have even implicated periodontal disease as a risk factor (Arbes, Slade et al. 1999; Beck, Elter et al. 2001), however have not proven causality (Hujoel, Drangholt et al. 2000). Although dietary amounts, sources, and types (soluble versus insoluble) of fiber have been shown to reduce the risk of heart attack (Liu, Buring et al. 2002; Negri, Vecchia et al. 2003), this author is unaware of studies that have examined the association between food sources of dietary fiber and heart attack risk in subjects with periodontitis.

This study was designed to determine whether total dietary fiber and fiber from different plant sources (vegetables, fruits, legumes, or cereals) modified self-reported HA risk, as well as acute-phase inflammatory responses in subjects with periodontitis using NHANES III data.

Objectives: The objective of this study was to investigate the association between total dietary fiber intake levels, and selected vegetables, fruits, legumes, and cereal fiber intake and the risk of self-reported history of heart attack (HA) in periodontitis subjects using data available in the Third National Health and Nutrition Examination Survey (NHANES III).

Materials and Methods: Adult participants in NHANES III were used in this study. Zero to thirty three (0-33) percent of sites with periodontal attachment loss > 3 mm was considered a healthy periodontium, while greater than thirty three percent (>33) of sites with periodontal attachment loss of > 3 mm as periodontitis. The outcome variable was the self-reported history of HA. Total dietary fiber, and monthly selected vegetable, fruit, legume and cereal consumption were divided into low and adequate levels. Data was analyzed by Kruskal-Wallis, ANOVA and multivariate analyses using SPSS ®. P<0.05 was used to reject the null hypothesis.
Results: Individuals with periodontitis, that consumed low levels of the selected vegetables and fruits had a significantly increased risk of self-reported HA for: low total dietary fiber intake levels (P<0.005); low levels of selected vegetables - low broccoli and any other vegetables (P<0.01); Brussels sprouts, carrots, cabbages, spinach and tossed salads (P<0.05), and low selected fruits – citrus fruits, peaches/nectarines and any other fruits (P<0.05), adjusting for confounders of both diseases and energy (Kcal). Adjusting the model further for serum antioxidants, dietary cholesterol and other fat intake maintained a significantly higher HA risk for: low total dietary fiber intake levels (P<0.05); low levels of selected vegetables - low broccoli, spinach (P<0.05) and any other vegetables (P=0.05); but significantly increased HA risk with low all-bran cereal (P<0.05). Serum CRP and creatinine, and plasma fibrinogen, were significantly affected by fiber quantity and source in periodontitis versus healthy periodontium subjects, and in periodontitis and healthy periodontium subjects individually (P<0.05)

Conclusions: It is theorized that subjects with periodontitis that consume inadequate levels of total dietary fiber, and inadequate fiber from selected vegetables, fruits, legumes, and cereals are likely to increase their risk of heart attack.

Keywords: Dietary Fiber, Periodontitis, Heart Attack