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Dietary patterns as a risk factor for cardiovascular disease in healthy US adults[4),5),6)]

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<u>Background.</u>   Research on dietary intake as a risk factor for cardiovascular diseases had initially focused on explaining the underlying mechanisms. That is a prerequisite process to establishing the validity of previously suspected and observed associations, i.e., hypotheses. Components in food have been the major focus of this process, which led to establishing the role of lipids and antioxidants as CVD etiology. Dietary behaviors, however, encompasses more than mere consumption of meals, foods or nutrients in a day and changes over time. The challenge is to capture the usual dietary intake through understanding dietary behaviors and underlying reasons of the behaviors.

<u>Objectives.</u>   To test the hypotheses that in the U.S. adults the complex dietary behaviors can be grouped into major dietary patterns that are related to risk factors for CVD; meal and snack patterns are associated with total dietary intake; and eating frequency were associated with dietary patterns and CVD risk factors.

<u>Approaches.</u>   Food-frequency questionnaire data from the third National Health and Nutrition Examination Survey were used in identifying dietary patterns of healthy U.S. adults over 20 yr old by factor analyses. The authors purposefully classified the food groupings for the subsequent factor analyses to be as close to those reported immediately before this investigation as possible. Selected CVD biomarkers, after log-transformed, were associated with major dietary patterns after controlling for confounding variables in regression analyses, accounting for the complex survey design and sample weights. In describing the relation between meal/snack patterns and total nutrient intake, we used the 24-hour recall data. Finally, the associations between daily eating frequency, the above identified dietary patterns based on food groupings, and selected risk factors for CVD.

<u>Findings.</u>   Six dietary patterns were identified with two of which emerged as the most prominent: Pattern one was characterized by frequent intake of processed meats, eggs, and red meats, and high fat dairy products. Pattern two was characterized by frequent intake of green, leafy vegetables, salad dressing, tomatoes and most vegetables including cruciferous vegetables and tea. The pattern one was positively associated at a statistically significant level with serum C-peptide, serum insulin, and glycated hemoglobin concentration, and inversely with

RBC folate concentrations after adjusting for confounding variables for CVD. Pattern two however indicated no linear relations with any of the biomarkers examined.

Daily eating frequency was associated positively with several daily nutrient intakes, i.e., carbohydrates, folate, vitamin C, calcium, magnesium, iron, potassium, and fiber; and inversely with protein, total fat, cholesterol, and sodium. Meal and snacking behaviors, a component of dietary patterns, are described by the following five most common categories: three meals with more than two snacks (32% population), two meals with more than two snacks (21%), three meals with one snack (15%) and three meals (8%) and others (24%). Groups with three meals with one or two snacks had the highest intake of all micronutrients examined, except for cholesterol, vitamin B-6, and sodium; while meal skippers had the lowest intakes of all micronutrients.

After controlling for confounding variables in multivariate analyses, daily eating frequency was positively associated with serum C-peptide concentration and dietary pattern two, but not dietary pattern one. When the dietary pattern two was further controlled for, the association between daily eating frequency and serum C-peptide concentration was no longer statistically significant.

So what?

The dietary patterns identified in this cross-sectional study are similar to those reported in other non-representative U.S. samples, and are associated with biomarkers of CVD risks. This confirms that dietary patterns can be a valuable approach for assessing dietary behaviors that may predict CVD risks. Meal and snack patterns may also be markers for nutrient intakes and therefore diet quality, health risk factors, and health outcomes. These research approaches, however, need to be improved to overcome several inherent subjective decisions that may lead to erroneous interpretation and conclusions.