

OBSERVATIONS

Metabolic Syndrome Is Associated With Adherence to an Unhealthy Diet

We read with interest the article by Freire et al. (1), which implicates that total dietary fat might increase the risk for metabolic syndrome. Conversely, they discovered an inverse relationship between linoleic acid intake and the metabolic syndrome. These data add to the mounting evidence describing the association between high dietary fat intake and features of metabolic syndrome either alone or in combination (2,3).

We evaluated dietary nutrient intakes and features of metabolic syndrome in a population-based cross-sectional study of 671 subjects (297 men and 374 women) aged 18–74 years in the Tehran Lipid and Glucose Study (4). Metabolic syndrome was defined according to guidelines of the Adult Treatment Panel III, and dietary intake was assessed using a 168-item semi-quantitative food-frequency questionnaire. Cutoffs for quartiles of dietary fats were calculated, and subjects were categorized according to the quartiles. The cutoffs were <25, 25 to <30, 30 to

<35, and $\geq 35\%$ of energy intake for quartiles 1–4, respectively. We found that subjects in the higher quartile of fat consumption had higher odds of having metabolic syndrome (odds ratios [ORs] by quartile were 1, 0.83, 0.76, and 0.7; P for trend <0.03). The most related component of the metabolic syndrome with fat consumption was serum triglycerides ($P = 0.003$), whereas fasting blood glucose showed no significant association with dietary fat intake. The values of ORs became weaker after adjustment for the indicators of a healthy lifestyle diet; thus, subjects in the lowest quartile of fat intake consumed more fiber, grains, dairy products, and fruits and vegetables than did subjects in the other quartiles. Also, a lower intake of fat was associated with less dietary meat intake. A multivariate-adjusted OR for the metabolic syndrome across quartiles of fat intake showed that adjusting for the effects of age, total energy intake, percentage of energy from fat, and physical activity might weaken the OR (by quartile: 1, 0.85, 0.75, and 0.7; P for trend 0.03). By further adjusting for the effects of dietary grain, dairy products, fiber, and fruits and vegetable intake, we found that the ORs became weaker in the second model (ORs by quartile: 1, 0.91, 0.86, and 0.75; P for trend <0.04). Moreover, after adjustment for the effect of meat in the third model, the probability of metabolic syndrome became weaker than it was in the first and second models (ORs by quartile: 1,

0.95, 0.91, and 0.82; P for trend <0.05). However, it remained significant after adjusting.

Our data indicate that metabolic syndrome is associated not only with more fat consumption but also with an overall unhealthy diet.

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DOI: 10.2337/dc06-1928

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