

Symposium 2: Nutrition and Chronic Disease – Part A

Diet and development of the insulin resistance syndrome

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Background - Insulin influences a large number of physiological functions in a variety of organs and tissues. From a broad perspective, insulin resistance provides the body with the ability to regulate the actions of this potent anabolic hormone in a highly discrete fashion. Many pathophysiological factors can alter the functions of insulin at one or more sites, potentially conferring biological benefit. However, insulin resistance and compensatory hyperinsulinemia in the setting of central adiposity adversely affects important diabetes and cardiovascular disease risk factors – namely glucose tolerance, blood pressure, serum lipids, coagulation tendency, chronic inflammation and perhaps oxidative stress – that together comprise the insulin resistance syndrome (IRS).

Review - Dietary factors have increasingly been recognized as important determinants of insulin resistance and, by implication, development of the IRS. Though low fat/high carbohydrate diets have been traditionally recommended to reduce risk for diabetes and cardiovascular disease, recent research has suggested that such diets may actually increase risk for IRS among susceptible individuals. On balance, macronutrient quantity may be less important in this regard than nutrient quality. Whereas saturated and trans-fatty acids increase insulin resistance, mono and poly-unsaturated fats decrease resistance and offer protection against disease. Similarly, some types of carbohydrate (refined starch, concentrated sugar) promote, and other types (high fiber, low glycemic index) protect against IRS. Beyond macronutrients, specific food groups have become the subject of increasing interest. Observational and interventional studies suggest that dairy products, including full fat versions, lower risk for IRS, an effect that might be mediated by intrinsic compounds in dairy (e.g calcium) or by displacement of less healthful foods (e.g soft drinks) from the diet. Preliminary studies suggest that certain micronutrients might also influence risk.

Conclusions - Among modifiable factors including weight loss and exercise, dietary composition appears to have an important effect on development of IRS. The available evidence suggests that IRS, and therefore diabetes and cardiovascular disease, can be prevented by a high fiber/low glycemic index diet containing dairy products and a higher amount of unsaturated fats than currently recommended.

References

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