Nutrition Revolution—The End of the High Carbohydrates Era for Diabetes Prevention and Management

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Abstract

Increased dietary carbohydrates contributed to the escalating prevalence of obesity and type 2 diabetes. From the late seventies, several medical societies recommended reducing fat intake and replaced it with carbohydrates. These mistaken recommendations contributed to poor diabetes control, abnormal lipid profile, and increasing insulin resistance without reduction in cardiovascular mortality. Over the last few years, strong evidence suggest reducing carbohydrates intake for patients with type 2 diabetes to less than 40%. The era of high carbohydrates came to an end.

Keywords

Low carbohydrates, obesity, type 2 diabetes

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In 1977, the select committee on nutrition and human needs of the US Senate recommended increasing carbohydrates intake to 55-60 % of the total caloric intake, while reducing fat consumption from approximately 40-30 % of the total daily calories.¹ The aims of these recommendations were to reduce health care costs and to maximize the quality of life of Americans as stated by George McGovern, the chairman of that committee. The proposed cost saving was related to the possible reduction in the incidence of heart disease, cancer, and stroke, among other killer diseases. Despite being controversial recommendations, which were based on weak scientific evidence, the United States Department of Agriculture (USDA) created a food pyramid and placed carbohydrates at its base.² The nation embarked on a vast nutritional experiment as stated by Philip Handler, the President of the National Academy of Science at that time. It was not a surprise that since then the prevalence of obesity went up significantly³⁻⁵ and, in contrary to the main aim of the recommendations, the prevalence of diabetes and cardiovascular disease also went up. Physiologically, this was explained by the increased insulin response to carbohydrates, which through its lipogenic effect increases storage of fat. It was later shown that accumulation of fat in the visceral area is associated with chronic subclinical inflammation that is directly related to insulin resistance, endothelial dysfunction, and atherosclerosis.6 Before these recommendations and from the turn of the twentieth century, diabetes was predominantly defined as a carbohydrate intolerance disease and was mainly treated by reducing carbohydrates intake. Thus, it was absurd that the American Diabetes Association (ADA) also agreed, at that time, to recommend increasing carbohydrates intake for patients with diabetes. Carbohydrates restriction was particularly successful before the discovery of insulin, where Elliot P Joslin successfully treated his patients diagnosed with fatty diabetes (later known as type 2 diabetes) with a diet that contained

side effects like constipation, headache, bad breath, and muscle cramps.8 Although the amount of carbohydrates intake was significantly relaxed after the insulin discovery, it never exceeded 40 % of daily caloric intakean amount that was shown to reduce the glucose and triglycerides area under the curve by around 40 %.9 Since 2003, many clinical trials confirmed that reducing carbohydrates was superior to reducing fat in decreasing body weight and in improving glycemic control.^{10–12} It was later shown that reducing carbohydrates for patients with diabetes improves insulin sensitivity, reduces visceral fat and triglycerides, and increases high-density lipoprotein (HDL)-cholesterol.¹³ More recently, a meta-analysis showed that reducing carbohydrates load and glycemic index was associated with a reduced risk for developing type 2 diabetes. After weight reduction, maintaining a diet lower in glycemic index and higher in protein was shown to maintain weight loss for a longer duration.¹⁴ Now, it is obvious that increasing carbohydrates in the diet increases glucose toxicity and consequently increases insulin resistance, triglycerides level, and reduces HDL-cholesterol. Recently, the ADA departed from the recommendation of high carbohydrates intake and recommended individualization of the nutrition needs. It is clear that we made a major mistake in recommending the increase of carbohydrates load to >40 % of the total caloric intake. This era should come to an end if we seriously want to reduce the obesity and diabetes epidemics. Such a move may also improve diabetes control and reduce the risk for cardiovascular disease. Unfortunately, many physicians and dietitians across the nation are still recommending high carbohydrates intake for patients with diabetes, a recommendation that may harm their patients more than benefit them.

only 2 % carbohydrates and 75 % fat.7 His eccentric diet was reincarnated

later as the Atkins diet. Such extreme reduction of carbohydrates, despite

being successful in treating type 2 diabetes, was shown to be associated with

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