

# Dietary Nuts and Pulses Beneficial in Diabetes

BY KATE JOHNSON

MONTREAL — A diet rich in pulses and nuts can improve glycemic control in type 2 diabetes patients to within ranges seen with pharmaceutical intervention, researchers reported at the World Diabetes Congress.

A meta-analysis of 41 trials of pulses, either alone or combined with low-glycemic or high-fiber diets, noted improved markers of long-term glycemic control (*Diabetologia* 2009;52:1479-95), reported Dr. John Sievenpiper of the risk factor modification center of St. Michael's Hospital, Toronto.

Another study, also conducted by his group, found that 75 g of mixed nuts daily for 3 months improved blood lipids and glycemic control in patients with type 2 diabetes, compared with a mixture of nuts and muffins, or muffins alone. "Whatever your favorite nut or form of nut, it's good to get it into your diet," said Dr. Cyril Kendall of the University of Toronto's department of nutritional sciences.

Both researchers acknowledged long lists of industry relationships: serving on advisory boards for a number of food companies, as well as the International Nut Council, and the Canola and Flax Councils of Canada, and receiving consultant fees from Pulse Canada.

"These are very nice, confirmatory studies," commented Dr. Jim Mann, an endocrinologist who was not connected to the analyses, but performed



**Dietary intake of pulses—such as chickpeas, beans, lentils, and peas—can help diabetic patients reduce postprandial glycemia.**

some of the first studies in the 1980s showing similar results.

"I believe implicitly that patients do respond to dietary advice. In fact, the degree of response for type 2 diabetes is quite often as great as it is for some of the medications, if people comply," the professor of human nutrition and medicine at Edgar National Center for Diabetes Research in Dunedin, New Zealand, said in an interview. "Most physicians don't believe that people will adhere sufficiently to dietary advice to make a significant difference, and because physicians are not convinced, neither are their patients. It takes an enthusiastic physician to get an enthusiastic patient."

Dietary pulses such as chickpeas, beans, lentils, and peas are characterized by a low glycemic index, high fiber content, high levels of amylose and resistant starches, and vegetable protein

and various other antinutrients "which may act as enzyme inhibitors," Dr. Sievenpiper said. "The effect is to decrease starch digestion and absorption and therefore postprandial glycemia."

In his meta-analysis, "modest improvement in medium to long-term glycemic control was seen when [pulses] were given alone or in combination with dietary maneuvers to reduce the glycemic index in the diet."

The analysis included 11 trials that examined consumption of pulses alone, which noted an overall decrease in standardized mean difference (SMD) of 0.71 in fasting blood glucose (FBG) and 0.62 in serum insulin. Similarly, 19 trials looking at consumption of pulses in low glycemic index diets noted an SMD decrease of 0.28 in glycosylated blood proteins—either hemoglobin A<sub>1c</sub> or fructosamine. And in 11 trials examining pulses in high-fiber

diets, there were SMD reductions in fasting blood glucose of 0.32 and in glycosylated blood protein of 0.27.

Based on these results, "we would expect about a 0.48% reduction in HbA<sub>1c</sub>, and this level of benefit approaches that seen with acarbose, exceeds the [Food and Drug Administration] proposed clinically meaningful threshold of 0.3%, and lies at the lower limit of efficacy of what you might expect for oral agents," Dr. Sievenpiper said.

The nut study randomized 117 patients with type 2 diabetes to consume either 75 g nuts, 38 g nuts and 1.5 bran muffins (150 kcal per muffin), or three muffins daily for 3 months. Nut portions included a mix of almonds, cashews, macadamias, pecans, pistachios, walnuts, and peanuts. All treatment portions were equivalent to 475 kcal/day and were designed to maintain rather than decrease body weight. The primary outcome of the study was change in HbA<sub>1c</sub> and serum lipids.

The patients' baseline characteristics were similar across the groups. They ranged in age from 61 to 63 years, 75% were men, ethnic backgrounds were diverse, and body mass indexes ranged from 28.8 to 30.3 kg/m<sup>2</sup>.

All patients were being treated with oral hypoglycemic medication, and their mean HbA<sub>1c</sub> level was 7.1%. Baseline lipid profiles were balanced across the groups, and the mean duration of diabetes was 7-8 years.

A total of 100 patients com-

pleted the study, with a similar dropout rate in each group.

An intention-to-treat analysis revealed that HbA<sub>1c</sub> levels were significantly lower in the nuts-only group, compared with the nut-muffin combination group (6.88% versus 7.02%), although the latter was not significantly lower than the muffin-only group (7.06%), Dr. Kendall said. There was a significant dose response seen in LDL cholesterol level, which fell by 0.19 mmol/L in the full-nut group, compared with full-muffin group.

Weight change from baseline was not significant, although there was a trend toward more weight loss in the nuts-only group. This was particularly interesting, given that more daily calories were consumed in this group (2,072 kcal), compared with the muffin-only group (1,932 kcal), Dr. Kendall said.

Previous studies by Dr. Kendall and his colleagues, as well as other studies, have shown this same effect, he said. "What we've found is that nuts are not entirely digested and there's an excretion of about 15%-20% that are simply not absorbed and pass through the gastrointestinal tract."

Previous unpublished work by his group has shown that nuts have favorable effects on postprandial glucose response to common carbohydrates such as white bread, potatoes, rice, and pasta. "You get a graded reduction in glycemic response depending on the dose of nuts," Dr. Kendall said. ■

## Exercise Added to Diet Improves Weight Loss in Diabetes

BY KATE JOHNSON

MONTREAL — The focus of lifestyle interventions for type 2 diabetes should be on combining weight loss diets with exercise, according to new research.

Weight loss is similar for either high-carbohydrate (HC) or a high-protein (HP) diets—with the addition of exercise fueling the benefits of either diet, reported Thomas Wycherley at the World Diabetes Congress.

The study, which was partially funded by the Pork Cooperative Research Centre in Australia, showed a nonsignificant trend toward better outcomes in patients on an HP rather than HC diet—an observation that makes sense for certain patients, remarked Dr. Jim Mann, an endocrinologist who was not connected to the study.

"I think there is a reasonable body of evidence that a high-protein diet may have some benefits [over a high-carbohydrate diet] for some people with the metabolic syndrome because these peo-

ple tend towards a lot of high-glycemic carbohydrates, which is not good," Dr. Mann, a professor of human nutrition and medicine at Edgar National Centre for Diabetes Research in Dunedin, New Zealand, said in an interview.

Previous research has indicated that there is some evidence that during weight loss, consumption of a high-protein diet may potentiate the impact of resistance exercise, compared with a high-carbohydrate diet, Mr. Wycherley said.

His study compared HC and HP weight-loss diets, with and without a resistance training program, over 12 weeks in 83 men and women with type 2 diabetes, 59 of whom completed the study. The groups had similar dropout rates.

The subjects were a mean age of 56 years, with a mean baseline body mass index of 35. The diets were equally energy restrictive (6 MJ/day for women and 7 MJ/day for men) and equal in fat content (about 25%), said Mr. Wycherley, a research assistant at the University of

Adelaide (Australia). The HC diet had 55% carbohydrate and 20% protein, with the goal of providing 0.8 g/kg per day of protein. The HP diet contained 40% carbohydrate and 35% protein with the goal of providing 1.2 g/kg per day of protein. Both diets consisted mainly of whole foods, with dairy, animal, and vegetable sources of protein, and whole grains rather than processed carbohydrates.

Overall, there was a mean weight loss of about 10 kg (10%) across all four groups. Subjects in the HC and HP groups lost a mean of 8.6 and 9.0 kg, respectively. However, for those who also attended exercise sessions three times a week, the weight loss was greater (10.5 kg for HC and exercise, and 13.8 kg for HP and exercise).

All treatment groups had similar improvements in traditional cardiovascular disease risk markers, with a 10% drop in both systolic and diastolic blood pressure, and drops of 0.47 mmol/L in triglycerides, 0.67 mmol/L in total cholesterol, and 0.37 mmol/L in LDL cholesterol.

Glycemic control also showed similar improvements in all groups, with a mean drop of 2.1 mmol/L in fasting glucose, 4.7 mU/L in serum insulin, and 1.25% in hemoglobin A<sub>1c</sub>.

"This really does reiterate the importance of achieving dietary weight loss in this patient group," Mr. Wycherley said.

Recent research has shown similar results of exercise and high-protein versus high-carbohydrate diets in nondiabetic subjects, he said, but until now this has not been studied in patients with diabetes.

"In response to the diabetes and obesity epidemic, we're seeing an increase in the prevalence of alternative diets such as high-protein diets. This has raised some conjecture in the literature regarding the optimal dietary composition to deliver the most therapeutic benefits to this patient group—in particular surrounding the carbohydrate to protein ratio," he said.

Mr. Wycherley did not declare any relevant conflicts of interest. ■