blood pressure measurements among 217 youth with type 1 diabetes for ≥5 years. Hypertension was defined as systolic and/or diastolic blood pressure >95th percentile for age, sex, and height at three consecutive clinic visits (2). Blood pressure was taken at each outpatient visit using an automated blood pressure device by trained medical assistants.

Sixty (28%) of 217 patients met the study diagnosis of hypertension (mean age 12.7 ± 3.2 years) after 5.7 ± 3.8 years of diabetes. These patients had higher systolic blood pressure z-scores (1.13 vs. 0.49, $P = 0.002$) and higher BMI z-scores (0.68 vs. 0.30, $P = 0.01$) at the time of diabetes diagnosis than did patients without hypertension. Only 21 of 60 (35%) had the diagnosis documented in the medical chart, and only 5 of 60 patients (8.3%) had therapy initiated specifically for treatment of hypertension. Spot-urinary albumin-to-creatinine ratios were categorized as normal (<20 μg/mg), high normal (≥20 but <30 μg/mg on two of three measurements), and microalbuminuria (≥30 μg/mg on two of three measurements). Seventeen (9%) of those with available data ($n = 190$) had microalbuminuria. This complication was more frequently addressed than hypertension, with 14 of 17 (82%) subjects being treated with ACE inhibitors. Patients who met study criteria for hypertension tended to have higher albumin-to-creatinine ratios. Of those patients with available data, 2 of 57 (4%) with elevated blood pressures had high-normal ratios and 8 of 57 (14%) developed microalbuminuria, while 0 of 133 with normal blood pressure had high-normal ratios and 9 of 133 (7%) developed microalbuminuria (P for trend <0.05).

Our analysis is retrospective and relies upon casual blood pressures, which may overestimate the true rate of hypertension. Nonetheless, our data indicate that adolescents with type 1 diabetes may develop blood pressure in the hypertensive range, and as suggested by the recent American Diabetes Association statement, this blood pressure may not be routinely recognized. This represents missed opportunities to confirm hypertension with repeat ausculatory measurement and/or 24-h ambulatory blood pressure monitoring and to intervene with lifestyle modification/pharmacologic therapy, all with the hope of preventing future micro- and macrovascular complications. Routine blood pressure assessment using appropriate age-, sex-, and height-dependent norms is an essential component of every visit to the diabetes clinic.

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COMMENTS AND RESPONSES

Recommendations for Management of Diabetes During Ramadan

Response to Al-Arouj et al.

Al-Arouj et al. (1) have made recommendations for fasting during the holy month of Ramadan for Muslim diabetic patients. The recommendations were drafted by an expert panel of diabetologists from around the globe, and it represents a landmark for practicing clinicians who look after diabetic Muslims. The recommendations were based on expert opinion rather than evidence-based scientific research, which, as the panel pointed out, is lacking in this area. These provisional recommendations await well-designed research aimed specifically at seeing whether fasting is beneficial or harmful to patients with type 1 diabetes.

Type 1 diabetic patients are often advised not to fast by physicians. The nature of type 1 diabetes makes fasting hazardous. Thus, type 1 diabetic patients are put in the category of very high risk in the recommendations. Evidence-based scientific data will definitely help physicians caring for such patients to decide whether to advise patients with type 1 diabetes strongly or half-heartedly about fasting.

Patient education regarding fasting during the holy month of Ramadan is badly needed. Research in this area is also deficient. In a recent study, only 33% of our diabetic patients received general advice on fasting during Ramadan (2). Morbidity related to fasting has been reported to be quite high. The rates of severe hypoglycemia and hyperglycemia were alarmingly high in the Epidemiology of Diabetes and Ramadan study, a population-based large epidemiological study that spanned 13 countries with sizeable Muslim populations (3). Such a high rate of fasting-related morbidity was reported earlier in a small study by Uysal et al. (4). Education of patients is the cornerstone of safe fasting, which is needed on both an individual and large-scale level, and this is the responsibility of diabetes care team members.

Diabetic patients with established renal disease run substantial risk of complications by fasting and rightly the recommendations put them in the high-risk category. The great majority of those patients have major comorbidities and are taking many drugs, including insulin and sulfonylurea agents, which make them prone to severe hypoglycemia. We feel that these patients need to be singled out more specifically in the guidelines as such groups, even those who receive renal replacement therapy, often insist on fasting (A.A.A.-A., unpublished observations). Fasting for prolonged periods, especially in hot climates, may impose negative impacts on renal function from hypovolemia and dehydration. The mainstay of management of those patients is targeted toward arresting the progression of their underlying renal disease, and fasting during Ramadan should not be recommended.

Another group that deserves special consideration is adolescent patients with type 1 diabetes. These patients should not be encouraged to fast, as recurrent severe

hypoglycemia may have grave consequences, especially on neurobehavioral development (5–7). We feel that this group should have been pointed out categorically.

Finally, we commend the efforts of the expert panel, which took the painstaking task of drafting these long-awaited recommendations. Taking the issue of Ramadan and diabetes further warrants randomized controlled studies to explore the perceived benefits and expected risks of fasting, which will provide the scientific platform for future updated recommendations. Only when this is coupled with mass educational campaigns to patients with diabetes will the expected benefits from fasting be fulfilled.

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Recommendations for Management of Diabetes During Ramadan

Response to Al-Arouj et al.

In their otherwise fine article concerning recommendations for the management of diabetes during Ramadan, Al-Arouj et al. (1) perpetuate an ingrained, but mistaken, view of the glycemic response to different kinds of ingested carbohydrates. Their recommendations of eating foods containing complex carbohydrates at the predawn meal and simple carbohydrates at the sunset meal is based on their stated assumption that digestion and absorption of the former is delayed and faster for the latter. These assumptions have been challenged by clinical research. For instance, Wahlquist et al. (2) showed in normal subjects and one type 2 diabetic patient that glucose appearance in the circulation was independent of saccharide chain length. Hydrolysis is so rapid in the gastrointestinal tract that the rate of glucose absorption from ingested monosaccharides (glucose) and polysaccharides (starch) was equivalent.

Therefore, one might expect that the amount of simple carbohydrate in the diet might not have much impact on postprandial glucose excursions. This was studied by measuring the effect of different proportions of simple and complex carbohydrate in meals in which total carbohydrate remained constant at 50% in type 2 diabetic patients (3). Three different ratios of complex to simple carbohydrates were evaluated: 80:20, 50:50, and 20:80. Glucose and insulin concentrations were measured hourly all day long, as was urinary glucose collected throughout the day. The results were similar in all three diets with small, but statistically significant, increases in plasma and urinary glucose levels in the diet containing 80% complex carbohydrate compared with the other two. It should be emphasized that all of the simple carbohydrate was from naturally occurring sugar in fruits, vegetables, and dairy products. No refined sugars were added to any of the diets. These results may be due, in part, to the fact that the natural sources of simple carbohydrate contained more fiber than foods furnishing the complex carbohydrate. However, it is now accepted that meals containing sucrose, incorporated into foods or desserts or even sprinkled onto cereal, do not lead to higher postprandial glucose excursions in either type 1 or type 2 diabetic patients (4–6). The latter observations are obviously independent of fiber. Thus, the type of carbohydrate, i.e. simple or complex, does not influence postprandial glycemic excursions.

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