Diabetologists and cardiologists are joining forces to address the issue of cardiovascular disease in patients with diabetes. In North America, new joint guidelines from the American Heart Association (AHA) and the American Diabetes Association (ADA) focus on the primary prevention of cardiovascular disease in patients with diabetes. (Circulation 2007;115:114-26; Diabetes Care 2007;30:162-72).

"People with diabetes are at increased risk for cardiovascular disease and have worse outcomes after surviving a CVD event," wrote coauthor Dr. John Buse, director of the diabetes care center at the University of North Carolina at Chapel Hill, and his colleagues.

And in Europe, the European Association for the Study of Diabetes (EASD) and the European Society of Cardiology (ESC) have issued guidelines on diabetes, prediabetes and cardiovascular diseases (Eur Heart J. 2007;28;88-136).

Although both the North American and European documents recognize the importance of harmonizing the approaches of cardiologists and diabetologists, they both also focus on specific and different aspects of the diabetes-cardiovascular disease dyad, making them potentially complementary documents. In both documents, special attention is placed on the early stages of disease development, but the European document focuses on the role of prediabetes in early cardiovascular dysfunction, whereas the North American documents emphasize primary prevention of cardiovascular disease in patients with overt diabetes.

The importance of the ADA/ AHA document is not so much its content, but rather its existence, suggested Dr. Daniel Einhorn, medical director of the Scripps Whittier Institute for Diabetes, an endocrinologist at the University of California, San Diego, and a spokesperson for the American Association of Clinical Endocrinologists (AAE). "What is new here is that these two organizations are agreeing to disagree in an effort to get together and hammer out common ground in the few areas where there were fairly nuanced differences," Dr. Buse said.

It was an effort to hammer out the consensus group in the few areas in which there were fairly nuanced differences.

Guidelines Target Hyperglycemic Crises in Adults with Diabetes

BY MIRIAM E. TUCKER
Senior Writer

The American Diabetes Association (ADA) has issued a revised consensus statement addressing the diagnosis, treatment, and prevention of diabetic ketoacidosis and hyperosmolar hyperglycemic state in adults with diabetes. Diabetic ketoacidosis (DKA) and hyperosmolar hyperglycemic state (HHS) are the two most serious acute metabolic complications of diabetes. Mortality in DKA patients is less than 5% in experienced treatment centers, whereas HHS mortality remains high, at about 11%. The annual incidence rate for DKA ranges from 4 to 8 episodes per 1,000 patients with diabetes, with an estimated hospital cost exceeding $1 billion a year, Dr. Abbas E. Kitabchi and his associates said (Diabetes Care 2006;29:2739-48).

Although patients with DKA have autonomic type 1 diabetes, patients with type 2 diabetes are also at risk during acute stress, such as that caused by trauma, surgery, or infection. Moreover, during the past decade, an increasing number of DKA cases without precipitating causes have been reported in individuals with type 2 diabetes, particularly those from minority groups.

Inadequate or inappropriate insulin therapy and infection are the two most common precipitating factors in the development of both DKA and HHS. Although HHS typically evolves over several days to weeks, the evolution of DKA in type 1 or type 2 diabetes tends to be much shorter. The classic picture of DKA includes a history of polyuria, polydipsia, weakness, weight loss, vomiting, abdominal pain, dehydration, weakness, mental status change, and coma. In HHS, the most common clinical presentation is altered sensorium, with signs of dehydration.

Initial laboratory evaluations of patients with suspected DKA or HHS should include the measurement of plasma glucose; blood urea nitrogen; creatinine; serum ketones; electrolytes (with calculation of the anion gap); osmolality; urine output; arterial blood gases; and serum bicarbonate. In patients with cardiac dysfunction, electrolyte imbalances, as well as the identification of comorbid precipitating events and above all—frequent patient monitoring. Protocols for the management of both DKA and HHS are included in the document, which is available free online (http://care.diabetesjournals.org).

Initial fluid therapy is directed toward expansion of the intravascular volume through intravenous administration of glucose and insulin. Initially, one liter of 0.9% saline should be given over 20-30 minutes, followed by 100 mL/hr. Subsequent fluid therapy should be restricted to 500 mL/hr. Patients with low-normal or low serum potassium concentrations (less than 3.5 mEq/L) and hypokalemia at presentation or developing hypokalemia should receive potassium replacement, because treatment lowers potassium further and can provoke cardiac dysrhythmias, they said.

Successful treatment of DKA and HHS requires the correction of dehydration, hyperglycemia, and electrolyte imbalances, as well as the identification of comorbid precipitating events and above all—frequent patient monitoring. Protocols for the management of both DKA and HHS are included in the document, which is available free online (http://care.diabetesjournals.org).

Criteria for resolution of DKA include glucose less than 200 mg/dL, serum bicarbonate greater than or equal to 18 mEq/L, and venous pH greater than 7.3. When a patient is able to eat, a multiple-dose schedule involving a combination of basal and premeal bolus insulins should be initiated as needed to control plasma glucose. To prevent hyperkalemia, potassium replacement is started after serum levels drop to less than 5.3 mEq/L, assuming the presence of adequate urine output. The use of bicarbonate in DKA remains controversial. At a pH greater than 7.0, the administration of insulin blocks lipoysis and resolves ketoacidosis without any added bicarbonate. However, limited data support the use of bicarbonate—along with potassium supplementation—in patients with pH values lower than 7.0, and particularly in those with lower levels than 6.9, for whom the risk for severe acidosis is elevated. Routine use of phosphate is not indicated in the treatment of DKA or HHS; data suggest it provides no clinical benefit. However, careful phosphate replacement may be indicated in some patients with cardiac dysfunction, anemia, or respiratory depression, With its focus on the identification of comorbid events and comorbid precipitating factors characteristic of the metabolic syndrome, the guidelines are largely subsumed in the type 2 diabetes syndrome," they write.

Dr. Einhorn said that even with some opposing viewpoints, a single set of guidelines shared by cardiologists and endocrinologists serves not only to clarify clinical practice, but to justify a preventive approach.

"It is important for people in managed care environments to have some validation that it is important to do testing, to screen and to follow up on these patients from a cardiovascular standpoint, even when they don't have any known cardiovascular disease yet. It offers some impetus in large medical group settings," he said.